



# COAL AGE



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No. 16

## What Is a Coal Operator?

The coal operator is an integral part of a coal mine, or rather, the coal mine might be called the product of the operator. To get a coal mine in operation you procure the component parts, which are as follows, figuratively speaking:

One tippie, one more or less complete line of mechanical equipment, one ditto electrical equipment, one hole in the ground, some capital and one large bonded indebtedness. After being carefully proportioned, mix, and add one labor union, and season with strikes. (Most operators prefer a very light seasoning.)

Some operators think labor unions are not at all essential; others who have labor unions wouldn't do without them—for the same reason that Bill Jones wouldn't do without the wart on his nose. The only way to get rid of the wart was to yield possession; that is—cut off the nose. The only way to get even with a labor union is to give 'em the mine; that would be about all from the labor union. Some operators think that's going too far.

Operators are both "homogeneous" and "cavernniverous"—"homogeneous" because they have homes like

real folks, and "cavernniverous" because they are supposed to dig millions out of a cavern or coal mine.

There was once an operator who made real money operating a coal mine. His coat sleeves were torn off and his arms yanked out of their sockets by brother operators who sought to lead him aside that he might tell them exactly how he did it.

Operators abound in Ohio and other valleys. They don't care much about abounding on the Ohio side—not in eastern Ohio anyway—they'd rather abound in West Virginia. Most of them that had car-fare are abounding down that way since "the little unpleasantness." Some one told them a mine in West Virginia would make a noise like a dividend.

Ohio operators are strong for Jimmy Cox—he's henchman and legislature. You know, they presented the operators with the "Run-of-Mine System."

Operators have unique forms of amusement. Among the more popular games is that of "Making an Agreement with the Miners." This game is not so popular in some sec-

tions as it is in others. They don't play it at all in Colorado. Someone tried to introduce it out that way, but after it had been censored by the Rockefeller Foundation it didn't look like the same old game. Another pleasant little game is called, "Going into the Hands of a Receiver"—very popular in Ohio since April 1, 1914. In Pennsylvania, they have for amusement a sport entitled, "Our Mines are Idle because the Men Don't Have their Buttons"—a very exciting little game. In Arkansas they play "Tippie, Tippie, Who Burned the Tippie?"

Some time ago a friend pointed out to me what he thought was a very typical specimen of the Genus Operatacuss. Much impressed, I approached and asked if I might have the privilege of propounding a personal question.

"Sure," replied the Operatacuss. "Shoot!"

"What is an operator?" quoth I.

"An operator, my boy, is the man who pays the bills. Most any one wins sometimes, but an operator—never!"

—By C. P. Shockley

## Ideas and Suggestions

### Value of Co-operation among Coal-Mine Employees

BY GEORGE S. BRACKETT\*

Coöperation at a mine means the united efforts of all employees working jointly to produce coal with a minimum waste of labor.

When real coöperation exists, an employee working by the hour will complete his allotted work and go home before the day is over on short time. If the services of a workman on day labor are not necessary, the man will promptly say so. Coöperation means further that employees at a mine take special pride in satisfying the consumers of the coal and in the prompt filling of the orders.

Most operators know what their coal is costing them under present conditions; but how many can even estimate what the cost will be under the above system of supposedly ideal coöperation? I have known small coal mines which approached such a coöperative plan, but I never saw that system in operation at a large mine.

Let us assume two average mines embodying the general run of mining difficulties, the only exception being that one mine has a force of day-men working efficiently and contentedly, saving in their supplies and tools and endeavoring to render the company a fair day's work in return for their wages. It is further assumed that these men act in every way as if they were working for themselves. In the other mine, the day laborers think only of doing as little work as possible.

#### THE MINING COST DIFFERS

At the two mines in question the payroll cost will differ considerably, and the management of the first-mentioned mine has effected a great economy by having constructed an organization which will operate the mine successfully under adverse difficulties. Labor-saving machinery and modern appliances are undoubtedly paying investments; yet a force of men who have a fair conception of real honest coöperation and a genuine desire to do their duty will operate a mine successfully, even though handicapped by a lack of proper equipment.

Welfare work of all description is the honest effort on the part of operators to produce satisfaction and coöperation among their employees. It has called for the expenditure of large sums, and the result has been a sad misunderstanding in many cases. These expenditures appear to the miner to be monuments to excessive profits, while in effect they are a vain attempt on the part of the operator to produce a favorable spirit among the employees so that dividends may be declared some time in the future. It is a case where employer and employee are misunderstood to their mutual disadvantage.

Few men can put the proper energy into their work when they imagine that they are being imposed upon, and profits can be realized for long periods only where the employees are contented. These conditions may be

brought about without expenditures on welfare work, and the operator's personality, fairness and fellowship may be his most valuable asset; for we find coöperative principles in small mines with crude houses and poor equipment.

#### AN INTERESTING QUESTION

I have asked many practical coal men the following question: "If you owned a small coal mine fully equipped and developed, ready to ship a small output, so arranged that you could with your own hands haul the coal, dump it, sharpen the miner's picks, trim the railroad car, clean the ditches, lay the track and do everything yourself that needed to be done other than the actual loading of the coal in the working places, how many tons of coal could you put on the railroad car per day? Remember that you are the only man on the job except the miners." The answers average 25 tons. This means that the actual value of all the work around a coal mine (excepting the miners') should follow the proportion of 25 tons per day-man per day. In order to confirm this base, the following are selected from a list of 454 mines in two states:

1. Averaged 42 tons per day for one year with two day employees, or 21 tons per day-man per day.
2. Averaged 365 tons per day for one year with 16 day employees, or 22.7 tons per day-man per day.
3. Averaged 429 tons per day for one year with 17 day employees, or 25 tons per day-man per day.
4. Averaged 218 tons per day for one year with eight day employees, or 27.2 tons per day-man per day.
5. Averaged 131 tons per day for one year with five day employees, or 26.2 tons per day-man per day.

The average of these is 24.4 tons per day-man per day, and these mines were selected for their unusually efficient operation. There are very few of them in the list of 454 mines, and they are given to show that this grade of efficiency has been reached by the willingness of the employees. The aggregate production and the number of day-men employed at all of the 454 mines show their average efficiency to be 11.4 tons per day-man per day. These figures and the following tabulation include all the employees inside and outside the mine:

	Tons per Day-Man per Day	Cost per ton (Labor Averaged at \$2.20 per Day)
Five mines.....	24.4	\$0.0902
454 mines.....	11.4	0.1930

In the 454 mines the labor work cost 10.28c. per ton more than it ought to have cost on a fair valuation.

Although I started out under an imaginary hypothesis the evidence that is brought to bear upon the subject points toward its realization in some cases. The saving of 10.28c. per ton is a minimum, as many of the 454 mines are operated with a very efficient force of men, and they include the five mines.

Looking at the question from another point of view, we have:

	Tons per Day-Man per Day	Cost per Ton (Labor Averaged at \$2.20 per Day)	Saving
64 efficient pick mines.....	16.76	\$0.1313	
100 inefficient pick mines...	9.66	0.2277	\$0.0964
139 efficient machine mines...	13.44	0.1637	
151 inefficient machine mines	8.29	0.2654	0.1017

The average of the saving in these two classes of mines

\*Flemington, W. Va.

is 9.90c. per ton, which is practically the same result obtained before.

Another interesting observation is the fact that in mines approaching labor troubles there is invariably a low efficiency, while in mines where these troubles are not active and peace reigns we find the best production per day-man. Again the 10c. per ton saving must be a minimum, as all the mines are included in the averages and a great many just border on the line drawn between efficient and inefficient. If only the extremes were taken, the saving would run close to 20c. per ton. This variation can only be due to one or more of the following reasons: 1. Natural mining difficulties. 2. Plant deficiencies. 3. Inefficiency in day labor.

#### WASTE OF LABOR DUE TO A LACK OF DESIRE

I have had intimate knowledge of plants operating under many natural difficulties with a day force as economical as any of the averages above quoted; also, I am acquainted with mines having many natural advantages and yet running with a day force capable of handling double the tonnage that is now obtained. A long driver's haul, a poorly located motor sidetrack, a bad roof or dip workings are expensive difficulties, but it is almost impossible for them to have any material effect on the average of so many mines under such able management.

Fundamental contentment and happiness produce an effect on the miners themselves; a less number are required for the same tonnage, fewer working places are needed, less extensive mine tracks are required, and a more compact organization results. This all tends to effect an additional saving.

Twenty per cent. of the supply and material expense at a mine may be eliminated if all the employees have the interests of their employers at heart. The detective and guard systems may be abandoned. Full efficiency can never be realized until there is the inherent desire among all employees; its essential part is goodwill from the management down to the lowliest trapper. If followed energetically the idea here discussed will work to the mutual advantage of both employer and employee.

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### How One Company Solved the Question of Credits

That the operator often complains of the slowness with which many retail coal dealers pay their bills is well known to the creditman. There are large retail dealers who discount bills, and there are some small ones too; but the retail dealer frequently is slow and loses not only the advantage of discounts and favorable prices, but also suffers when suffering is needless.

A study of retailers' methods might throw some light on the situation that would be surprising. Not long ago a retail dealer in a Middle-Western city added two large automobile trucks to his delivery equipment. These trucks were larger than any he had used previously and reduced the cost of delivering several cents a ton, but he placed the few cents saved at the bottom of his footings. He even remarked that he could go back to the old wagon, scoop shovel and day labor and make a profit. Why?

That question was promptly asked, and credits was the reply. The credit-man of that company refuses to accept an account just because an order has been given. He asks many questions, calls for credit reports and then

passes upon the financial standing of the prospective customer.

Two classes of accounts are not accepted on credit: First is the boarding- or rooming-house customer. Experience in a large city has shown that these consumers are likely to move, have very little ready capital as a rule and are without assets. A few who own property and have proven their ability to pay their bills promptly may be allowed a limited line of credit. But when they are, they are not in the class known as boarding-house or rooming-house proprietors.

The second class of poor credit is the apartment house. Though large consumers of coal, the responsibility of the average owner is small. In the first place the buildings are almost without exception heavily mortgaged. Frequently a second mortgage stands against the property, and the income is held to satisfy the second mortgage. Another serious feature is the speculation that develops in the real-estate business. The buildings are frequently sold, and the owner, having obtained his money, is not interested in old bills. The new owners dodge the bills by referring the collector to the former owner.

The known deadbeat is never given credit, and the man who owns large property, but lets his bills run four to six months, is promptly checked off the books of this company.

Limited credit is extended to home-owners who are paying for property on the monthly-payment plan. It has been found by experience that those who have bought homes with a few hundred dollars to pay down and are paying off the balance on monthly payments against land contracts will let every bill go rather than fall in arrears on their home-purchase payments.

Credit not to exceed 60 days is allowed any customer, and those who do not pay their bills within 30 days are not given large lines of credit.

#### REFUSES CREDIT ON SMALL ORDERS

This particular coal dealer makes it a rule to refuse a customer credit on orders for half a ton and a ton, unless the order is from an old customer of approved credit. Fully 50 per cent. of the retail coal business in a large city is half-ton and ton trade, and the smallness of the accounts makes collecting and losses such a large expense that there is no profit left.

The company that follows this strict plan of extending credit has grown from a single horse-and-wagon business to the largest trade in northern Ohio. The success of the venture has been in proportion to the extreme care exercised in extending credit. For one customer who is lost through careful inquiry into his paying quality and ability two have been gained. The company tries to purchase the best quality of coal it is possible to get, pays for it at discount terms and carefully grades prepared sizes in its own yards, and the trade appreciates the advantages thus obtained.

The credit-man takes the view that it is just as proper to require statements from retail customers as it is for the wholesale dealer to make inquiry of the large buyer. This is explained to the customer seeking credit, and except to those who are unable to stand investigation it seldom proves offensive. The system has been so carefully worked out that the retail business of the company is considered and has been proved less hazardous than its wholesale trade.



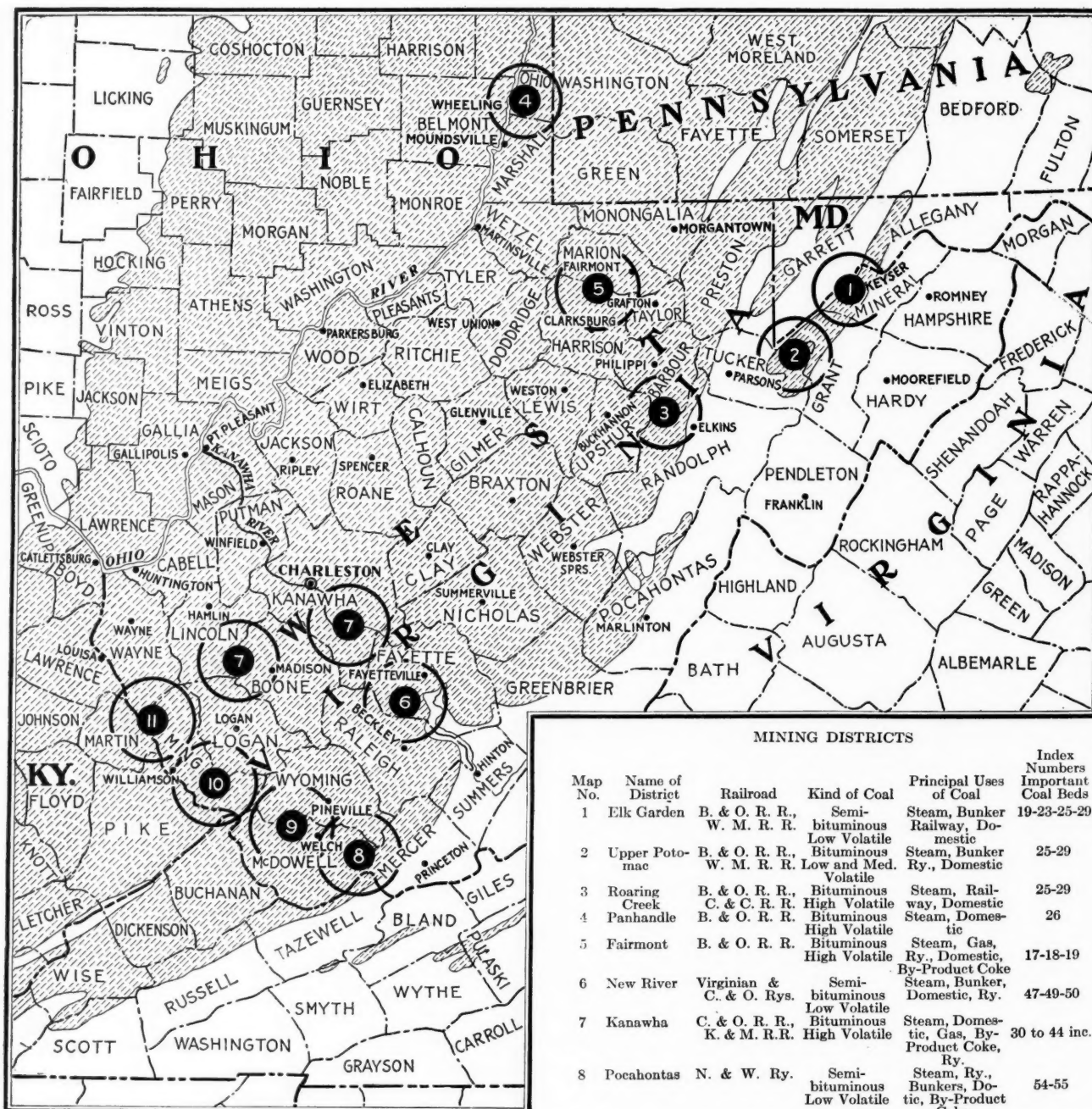
# The Coal Fields of West Virginia

By J. S. BURROWS\*

**SYNOPSIS**—Description of the coal fields of West Virginia, showing the location of the important districts and the geology of the coal-bearing measures. A brief sketch of the commercial importance of the different seams is given and the principal railroads in the various districts.

Coal mining is by far the most important industry in West Virginia and in fact the only industry in that state

sq.mi., 17,000, or more than 70 per cent. of the state, lies in the coal fields which form a part of the Appalachian region. Among the coal-producing states of the country, West Virginia now holds second place, having contested this position (next to Pennsylvania) with Illinois for a number of years. As the last of the important coal-producing states to open and develop its coal resources, West Virginia's rapid advance is truly remarkable. While a large proportion of Pennsylvania and Illinois coal is used within the borders of these states, almost the entire



PRINCIPAL DISTRICTS OF WEST VIRGINIA

in which any considerable proportion of the population is engaged. Out of a total area of slightly more than 24,000

\*Fuel expert, Castner, Curran & Bullitt, Inc., Norfolk, Va.

## MINING DISTRICTS

Map No.	Name of District	Railroad	Kind of Coal	Principal Uses of Coal	Index Numbers Important Coal Beds
1	Elk Garden	B. & O. R. R., W. M. R. R.	Semi-bituminous Low Volatile	Steam, Bunker Railway, Domestic	19-23-25-29
2	Upper Potomac	B. & O. R. R., W. M. R. R.	Bituminous Low and Med. Volatile	Steam, Bunker Ry., Domestic	25-29
3	Roaring Creek	B. & O. R. R., C. & C. R. R.	Bituminous High Volatile	Steam, Railway, Domestic	25-29
4	Panhandle	B. & O. R. R.	Bituminous High Volatile	Steam, Domestic	26
5	Fairmont	B. & O. R. R.	Bituminous High Volatile	Steam, Gas, Ry., Domestic, By-Product Coke	17-18-19
6	New River	Virginian & C. & O. Rys.	Semi-bituminous Low Volatile	Steam, Bunker, Domestic, Ry.	47-49-50
7	Kanawha	C. & O. R. R., K. & M. R.R.	Bituminous High Volatile	Steam, Domestic, Gas, By-Product Coke, Ry.	30 to 44 inc.
8	Pocahontas	N. & W. Ry.	Semi-bituminous Low Volatile	Steam, Ry., Bunkers, Domestic, By-Product Coke	54-55
9	Tug River	N. & W. Ry.	Semi-bituminous Low Volatile	Steam, Railway, Domestic, By-Product Coke	46-47-48-49
10	Thacker	N. & W. Ry.	Bituminous High Volatile	Steam, Domestic, Railway	32-33-35 36-37-38 42-43-44
11	Kenova	N. & W. Ry.	Bituminous High Volatile	Steam, Domestic	32-33-36-38



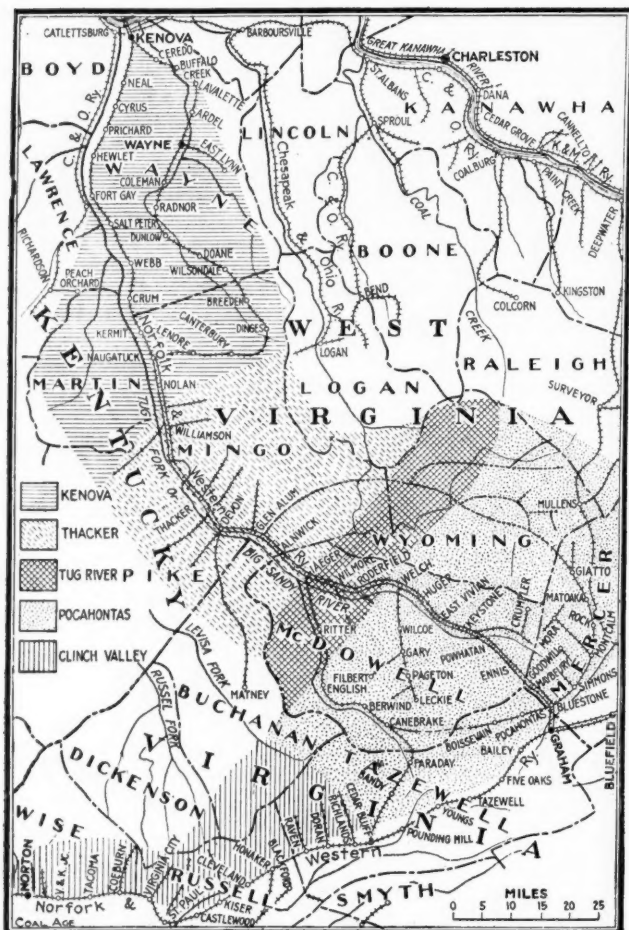
## The Bituminous Coalbeds of West Virginia

Index No.	System	Series	FORMATIONS	NAMES OF COAL BEDS	LOCAL NAMES OF COAL BEDS	COMMERCIAL VALUE AND IMPORTANCE
1	Permian	Dunkard XVI	Dunkard XVI	Windy Gap		No commercial value but of interest as the highest known coal, geologically, of the Appalachian field. Found near Belltown, Marshall Co.
2				Gilmore		No commercial value.
3				Ninevah		No commercial value.
4				Hostetter		No commercial value.
5				Fish Creek		No commercial value.
6				Dunkard		No commercial value.
7				Jollytown		No commercial value.
8				Hundred		No commercial value.
9				Washington A		No commercial value.
10				Washington	Hobson, Chestnut Oak coal, Hickory coal.	The only coal bed of this formation with any possible but doubtful value. No present commercial value.
11				Little Washington		No commercial value.
12				Waynesburg B		No commercial value.
13				Waynesburg A		No commercial value.
14	Carboniferous	Upper	Monongahela (Upper Productive) XV	Waynesburg		Dirty coal of doubtful value, mined for local use.
15				Little Waynesburg		No commercial value.
16				Uniontown	Mapletown	No commercial value.
17				Sewickley		Valuable along Monongahela River and Marion counties and mined for shipment to a small extent.
18				Redstone	Century coal.	High-volatile coal widely distributed south of the Fairmont region and mined to a considerable extent in the vicinity of Century. One of the most valuable coal beds in the United States occupying a large area in the northern part of the state where it is extensively mined in the Fairmont district and yields both high grade gas and coking coal.
19				Pittsburg	Fairmont coal, Clarksburg coal.	
20		Lower	Conemaugh (Lower Barren) XIV	Little Pittsburg		No commercial value.
21				Elk Lick	Threefoot bed, Jacksonville coal.	Mined to some extent on the C. & C. R. R. and on the Maryland side of the Upper Potomac region but generally of little value.
22				Harlem	Friendsville, Crinoidal	No commercial value.
23				Bakerstown	Fourfoot coal	Mined to some extent in Upper Potomac Region.
24				Brush Creek (Mahoning)		No commercial value; mined for local use.
25		Pennsylvanian	Allegheny (Lower Productive) XIII	Upper Freeport		Of value only in northern counties. It is mined to some extent in the Upper Potomac district, where it yields a semi-bituminous coal and along the Morgantown & Kingwood R.R. as well as along the C. & C. R. R. where it yields medium and high-volatile coal. Found in the northern counties but of little or no commercial value except in the Panhandle where it is mined to some extent.
26				Lower Freeport	Roger Vein	Irregular coal of comparatively little commercial value mined for local use in northern part of the state where it is of the high-volatile type.
27				Upper Kittanning	Mahoning coal	No commercial value.
28				Middle Kittanning		One of the important coals of this state. Widely persistent throughout coalfields. Very extensively mined in northern part of the state where it yields a large tonnage of semi-bituminous coal in the Upper Potomac district and vicinity, and high-volatile coal in the Roaring Creek district and vicinity. It has been traced southward as far as the Kanawha district where as the No. 5 Block it supplies considerable tonnage.
29				Lower Kittanning	Davis coal, Roaring Creek coal, North Coalburg coal, No. 5 Block coal, Mason coal.	No commercial value unless the No. 5 Block should prove to be at this horizon.
30			Upper Pottsville Kanawha Group	Clarion		
31				Brookville (Possibly No. 5 Block)		
32				Stockton-Lewiston	Big bed of Mingo and Logan Counties	High-volatile bed of wide persistence in and to the northward of the Kanawha district. It has also been identified in the Thacker district and is mined on a commercial scale in both regions. Locally it yields a good cannel coal.
33				Coalburg	Twin seam; Buffalo Creek bed of Mingo Co.	One of the valuable coals of the Kanawha series. Extensively mined in the Kanawha district and although mined to a less extent in the Thacker district where it is sometimes known as the Buffalo Creek coal, it is also of great commercial importance there. This coal is of the high-volatile type and yields both gas and splint coal.
34				Winifrede	Black band coal	One of the most valuable beds of the Kanawha and Thacker districts. It has been mined for years in the former and is being extensively developed in the latter district. It is a high-volatile bed and yields a large tonnage of high grade splint coal.
35				Chilton		Irregular impure bed in the Kanawha district and of no commercial value.
36				Thacker (Possibly Cedar Grove)		The most important coal of the Thacker district, where it is mined on a large scale. It is a high-volatile coal and yields some splint.
37				Cedar Grove		Thin (high-volatile) coal mined to some extent in the Kanawha district and locally the source of high grade cannel coal. The Thacker coal may belong to this horizon.
38				Peerless	Alma in Thacker District	Comparatively unimportant high-volatile bed in the Kanawha district but as the Alma coal (provisional correlation) of the Thacker district it has considerable value.
39				No. 2 Gas	Island Creek coal in Logan Co.; Ansted in Fayette county; Warfield and Rawl coal in Thacker district.	The most widely distributed and important coal of the Kanawha series. Stands first in production in the Kanawha district and as the Warfield coal (provisional correlation) is extensively mined in the Thacker district. It is generally high-volatile in character but locally of the medium-volatile type and yields both gas and splint coal with occasionally some cannel.
40				Powellton		High-volatile bed somewhat extensively mined in the Kanawha district to which its workable area is practically confined.
41				Eagle		One of the important coals of the Kanawha series mined at a number of places in the Kanawha district and probably in the Thacker district where the Upper War Eagle may prove to be at this horizon. A typical high-volatile coal.
42				Little Eagle		Thin (medium-volatile) bed found in the Kanawha district, but not mined at present on a commercial scale.
43				Upper War Eagle (Probably Eagle)	War Eagle No. 2; Coking seam in Wyoming Co.	Medium and high-volatile bed. Mined somewhat extensively in Thacker district and locally in Wyoming County.
44				Middle War Eagle	War Eagle No. 1; Middle Warfield	Medium and high-volatile coal. Mined somewhat extensively in vicinity of Altwick Thacker district and found also in Raleigh and southern Fayette County.
45				Lower War Eagle	War Eagle No. 0	Thin semi-bituminous bed found on southern margin of New River-Pocahontas districts and not mined on a commercial scale.

(Table continued on following page)

## THE BITUMINOUS COAL BEDS OF WEST VIRGINIA—(Continued)

Index No.	System	Series	FORMATIONS	NAME OF COAL BEDS	LOCAL NAMES OF COAL BEDS	COMMERCIAL VALUE AND IMPORTANCE
45	(Upper) Carboniferous	Pennsylvanian	New River Group	Hughes Ferry (Sharon Coal horizon)		No commercial value. Persistent over southern Nicholas and western Greenbrier County.
46				Iaeger		Thin dirty semi-bituminous coal. Possibly a split from the Sewell coal. Known area limited to Tug River district in the vicinity of the town of Iaeger, where it is mined to some extent.
47				Sewell	Davy, in Tug River district	The most extensively developed of the three important semi-bituminous beds of the New River district where it has held first place in production for many years. The Davy coal of the Tug River district is believed to represent the Sewell coal in McDowell County where it is extensively mined over a small area and yields an exceptionally pure soft coal which is used principally for by-product coke purposes.
48				Welch	Tug River seam; Hemphill; Lambert.	Provisionally considered a distinct bed. May be part of Sewell above. Found in McDowell County where it is semi-bituminous in character and where it is extensively mined in the Tug River district.
49				Beckley	War Creek in Tug River District; White-stick.	One of the three valuable semi-bituminous beds of the New River district. The newest mining operations are in this bed, large areas having been made accessible in Raleigh County through the building of the Virginian Railway, on which the principal operations are located many of which also have a C. & O. Ry. connection. This bed is destined to take first place in the production of New River coal.
50				Fire Creek (Quinnimont)		The lowest of the three valuable semi-bituminous beds of the New River field. The first bed to be mined along New River and for many years the premier seam of this region. Partial exhaustion has relegated it to third place in production. Principal operations are on the C. & O. Ry. in the New River district.
51				Little Fire Creek		No commercial value.
52			Pocahontas Group	Pocahontas No. 6		Small areas of semi-bituminous coal of considerable value in McDowell County where at present it is occasionally mined on a small scale.
53				Pocahontas No. 5		Limited areas of semi-bituminous coal in McDowell County, not mined at present but has a possible future value.
54				Pocahontas No. 4	Thin Vein Pocahontas	Second in importance to the Pocahontas No. 3 coal and now mined extensively in the western end of the Pocahontas district and in the Tug River district with important undeveloped areas of good semi-bituminous coal in Raleigh, Wyoming, McDowell, and Mercer counties.
55				Pocahontas No. 3	Pocahontas Thick Vein Pocahontas Flat Top	One of the most valuable coal beds in the United States and the source of the well-known brands of Pocahontas semi-bituminous coal. The present operations in this bed are confined almost exclusively to the Pocahontas district of the N. & W. Ry. The workable areas are confined within Mercer, Raleigh, Wyoming and McDowell counties with a small adjoining area in Tazewell County, Virginia.
56				Pocahontas No. 2		Thin coal of no commercial value.
57				Pocahontas No. 1		Thin coal of no commercial value.



N. &amp; W. Ry.'s DESIGNATION OF COAL FIELDS ON ITS LINE

output of West Virginia is shipped to markets beyond the state's boundaries and is used in a larger territory than the coal of any other state in the country.

The principal mining districts are shown in the accompanying table, which gives particulars as to kind of coal, railroads, etc. The index of important coals being mined in each district refers to the table of coal beds; as will be seen, this gives a complete list of all the coals recognized in the state, arranged in their geological sequence from the lowest to the highest. The arrangement of this table is the same as those I prepared for the states of Pennsylvania and Ohio, which have already appeared in *COAL AGE*.

Of special geological interest in the West Virginia coal measures is the importance of the Pottsville formation. While this formation is of little or no commercial value as a coal-bearing horizon in Ohio and Pennsylvania, in West Virginia it carries the most important seams of the state and is probably the most valuable coal-bearing horizon in the United States if not in the world.

**Recovery of Excessive Freight Charges**—Suit cannot be maintained in a state court to recover against a railway company on the theory that freight charges collected on interstate shipments were excessive, if the rates charged conformed to published tariffs, and no order for a refund or reparation has been made by the Interstate Commerce Commission. (*Nebraska Supreme Court, F. A. Foster Lumber Co. vs. Union Pacific R.R. Co., 151 Northwestern Reporter 168.*)

**Statutory Safety Requirement not Controlled by Custom**—The requirement of the Kentucky Mining Law that miners select their own caps and props and mark them, cannot be controlled by a custom to the contrary in a particular mine, so as to charge the operator with liability for death of a miner in a suit based on claimed failure of the operator to furnish caps and props under a custom requiring the foreman to furnish them on mere request. (*Kentucky Court of Appeals, Palmer's Administratrix vs. Empire Coal Co., 172 Southwestern Reporter 97.*)

# The Successful Use of the Chain Grate Stoker

By T. A. MARSH\*

**SYNOPSIS**—For many years the use of the chain grate stoker was confined to the high-volatile, high-moisture, and high-ash but noncoking coals of the West and Middle West. More recently a type of this machine has been devised which successfully handles the low-ash coking coals of the East.

The type of stoker most extensively used in the districts tributary to the bituminous coal fields of the West is the chain grate, and the extensive development of this

the demand for chain grates to broaden, and the ability to burn the semibituminous coking coals of the East, and also the high-ash and high-moisture coals of the West, has become a very important matter.

Previous to three years ago, the chain grate was considered absolutely inapplicable to the coking coals of the Eastern seaboard, and the Green Engineering Co. did not attempt to place its standard chain grate stoker in any locality which involved the use of a coking fuel. The characteristics of such a coal and its action when subjected to heat make it impossible to uniformly ignite, coke and consume this fuel unless it is treated by auxiliary

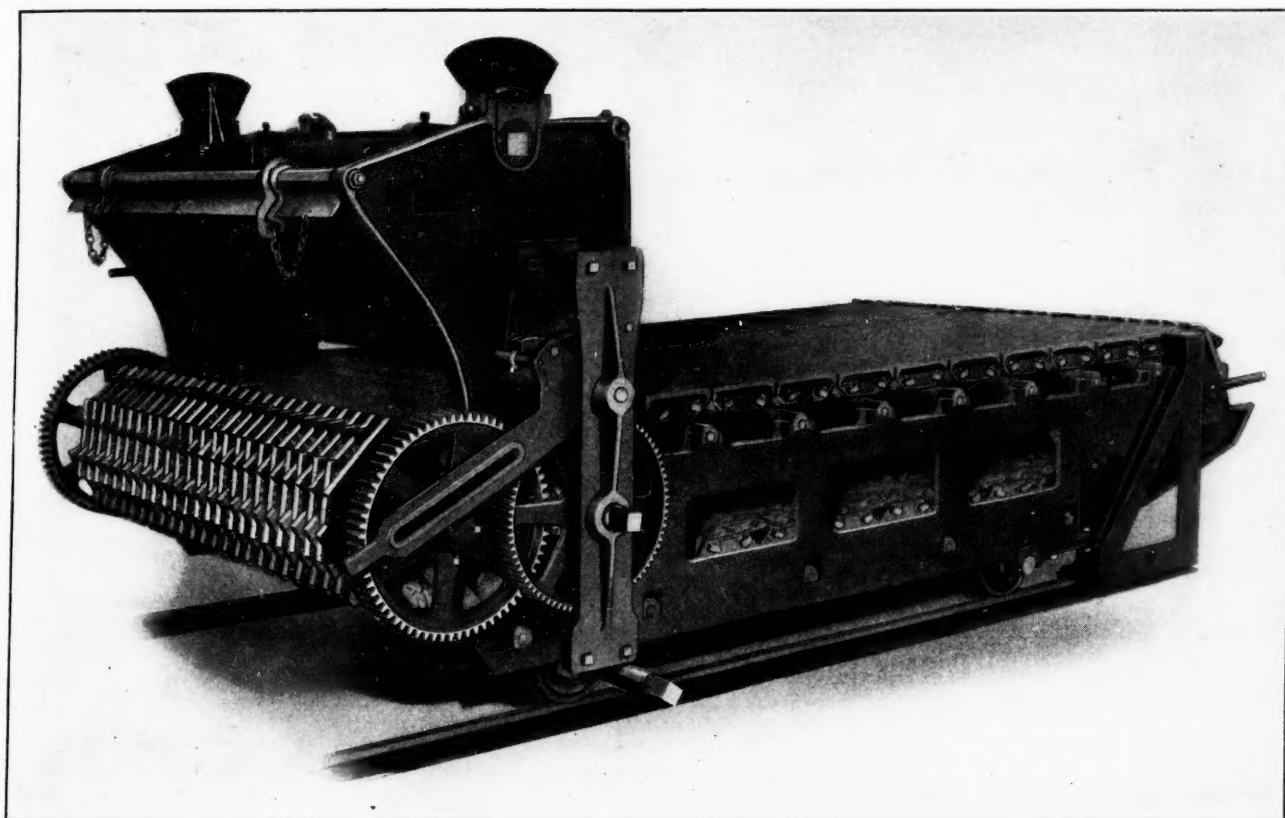


FIG. 1. A STANDARD GREEN CHAIN GRATE STOKER REMOVED FROM THE BOILER FURNACE

machine has been made in the Middle West where the free-burning bituminous coals are obtained.

An average analysis of the free-burning bituminous coal of the Middle West is as follows:

Moisture .....	5 per cent.
Volatile matter .....	30 per cent.
Fixed carbon .....	55 per cent.
Ash .....	10 per cent.
B.t.u. per lb. of dry coal .....	12,000

On account of the simplicity of operation, low maintenance and particularly the ability to obtain high efficiency in operation, this type of stoker has become more and more widely used until the Green Engineering Co. alone has over two million horsepower in service.

The successful results so generally obtained caused

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means to an extent which the standard chain grate does not and cannot provide.

Increase in the draft only serves to accentuate the difficulties which are found to be present in such cases, causing holes to develop in the fuel bed, permitting a marked short-circuiting of the free air and seriously diluting the furnace gases. Even though the fuel can be successfully ignited, it has a tendency to draw together into solid masses of coke which burn only on the surface. These masses will then remain almost indefinitely as coke and either form an undesirable accumulation at the bridgewall or pass into the ashpit unconsumed.

In addition to this unavoidable characteristic of this fuel, it forms a practically impervious layer near the front of the stoker and does not permit of the passage of



air under the influence of the furnace draft. It is, therefore, most difficult to ignite if undisturbed and almost equally difficult to consume even if the ignition is successful and the draft sufficient to furnish oxygen.

The Eastern coals do not as a rule carry much ash, but the intensity of the heat which results from the combustion of clean fuel is such that the impurities contained readily melt in the furnace, and those types of stokers which disturb the general formation of the fuel bed inevitably produce clinkers by the fusing of the ash. There is but one proper method of burning bituminous coal and that is to allow it to remain quiet during the latter stages of combustion. Ash is naturally formed first at the grate surface where the oxygen supply is greatest and where the

mitted to "set" so as to cement such particles together.

The length of the incline and the extent of its agitation are sufficient to provide for the complete distillation of the combustible volatiles. This precludes further caking of the material and produces a resultant fuel bed in the form of uniform coke of comparatively small size. The fragmentary and porous nature of such a fuel bed in turn permits the carrying of unusually thick fires and the nearly complete extraction of the oxygen from the entering air.

With this arrangement it is quite possible to develop 14 to 16 per cent. of  $\text{CO}_2$  in the furnace gases under conditions of commercial operation.

The efficient burning of high-ash and of high-moisture

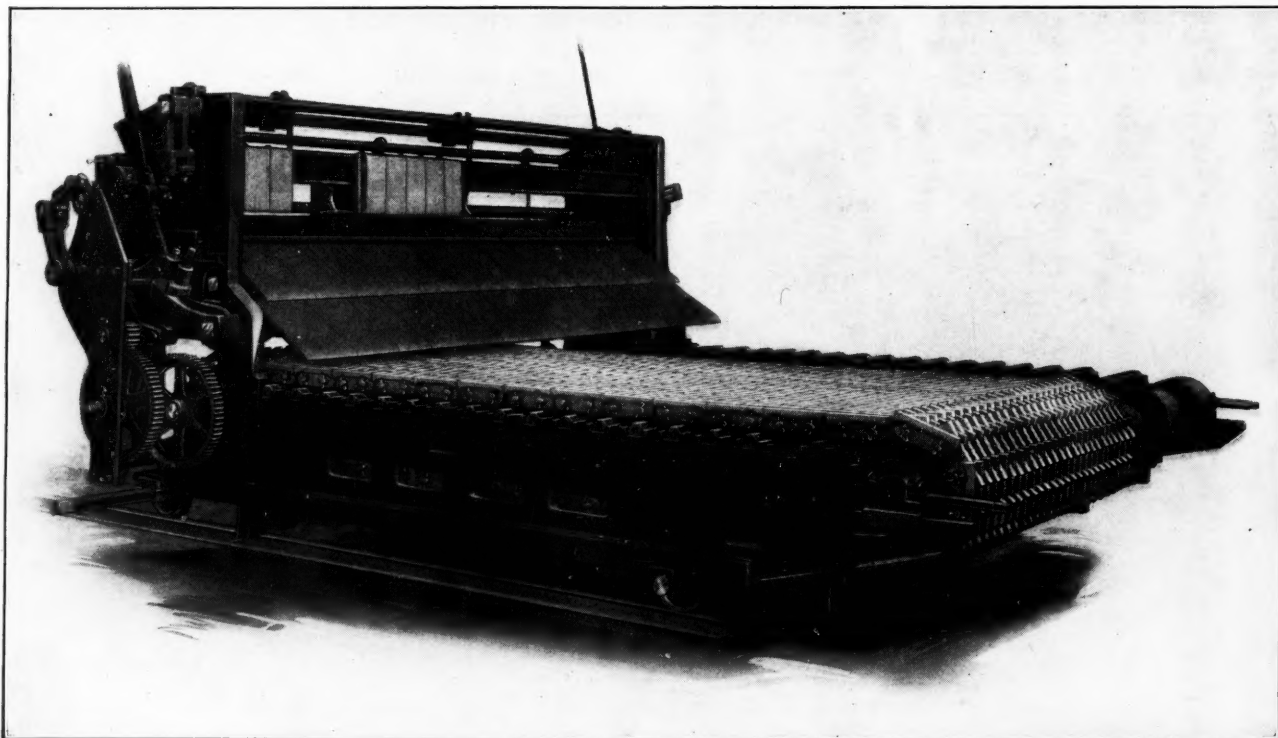


FIG. 2. THE "L" TYPE OF CHAIN GRATE STOKER, SHOWING THE OSCILLATING INCLINED COKING PLATES AT FRONT END

combustion is therefore earliest completed. An inversion of the fuel bed brings this ash layer to the surface with the incandescent carbon below, and the fluxing of the ash is inevitable. There is no getting away from the fact that this action is objectionable to an extreme degree, it being the primary cause of both the brick and metal deterioration in the furnace of the stoker which inverts or mixes the fuel.

#### TWO COMBUSTION ZONES ARE PROVIDED

The "L" type of chain grate stoker manufactured by the Green Engineering Co. provides for two distinct zones in the combustion process—the first being for the distillation and ignition of the combustible volatiles; the second for the combustion of fixed carbon. The inclined coking plates, over which the fuel flows in its descent from the hopper to the chain grate surface, are agitated to a sufficient extent to keep the fuel particles in constant motion relative to one another. The binding substance which exudes from the particles of coal is thus not per-

coals is entirely a question of furnace proportions and design, and the individual fuels must be studied and treated on the basis of experience.

It is not generally known that the lignites of Colorado as well as the coals of Texas that contain more than 25 per cent. of moisture can be burned with excellent results. Figures given below are from actual tests and were obtained in plants burning these fuels regularly. These figures can be depended upon as reliable.

#### TEST NO. 1

Fuel—Colorado lignite.	
Fuel analysis—	
Moisture .....	23.73 per cent.
Volatile matter .....	33.23 per cent.
Fixed carbon .....	35.25 per cent.
Ash .....	7.79 per cent.
B.t.u. per lb. dry .....	11,160
B.t.u. per lb. as fired .....	8,520
Type of boiler—Babcock & Wilcox.	
Type of stoker—Green chain grate.	
Horsepower of boiler.....	400
Grate surface .....	103 sq.ft.
Pounds of coal burned per square foot of grate surface per hour.....	28
Horsepower developed .....	512
$\text{CO}_2$ at damper.....	12.1 per cent.
Combined efficiency of boiler and furnace....	69.7 per cent.

## TEST NO. 2

Fuel—Texas lignite.	
Fuel analysis—	
Moisture .....	29.8 per cent.
Volatile matter .....	31.34 per cent.
Fixed carbon .....	25.71 per cent.
Ash .....	13.15 per cent.
B.t.u. per lb. of coal dry .....	9,838
B.t.u. per lb. of coal as fired .....	6,906
Type of boiler—Babcock & Wilcox.	
Type of stoker—Green chain grate.	
Horsepower of boiler .....	600
Grate surface .....	132.5 sq.ft.
Pounds of coal burned per square foot of grate surface per hour .....	31.6
Horsepower developed .....	586
CO <sub>2</sub> at damper .....	12.2 per cent.
Combined efficiency of boiler and furnace....	68 per cent.

## TEST NO. 3

Fuel—Texas lignite.	
Fuel analysis—	
Moisture .....	30.93 per cent.
Volatile matter .....	30.96 per cent.
Fixed carbon .....	26.45 per cent.
Ash .....	11.66 per cent.
B.t.u. per lb. of coal dry .....	10,314
B.t.u. per lb. of coal as fired .....	7,124
Type of boiler—Babcock & Wilcox.	
Type of stoker—Green chain grate.	
Horsepower of boiler .....	600
Grate surface .....	132.5 sq.ft.
Pounds of coal burned per square foot of grate surface per hour .....	30.6
Horsepower developed .....	615
CO <sub>2</sub> at damper .....	11.3 per cent.
Combined efficiency of boiler and furnace....	71.3 per cent.

Coals which contain a high percentage of ash require a materially different design of furnace from low-ash fuels, but in both cases the grate surface should be large and the igniting arch ample. Some results from high-ash coal from Texas and Arkansas are given below, indicating that with proper furnace design and proportions excellent results can be obtained. It should be noted that in all of these tests both the CO<sub>2</sub> and the boiler efficiency are fairly high.

## TEST NO. 4

Fuel—Arkansas semibituminous.	
Fuel analysis—	
Moisture .....	3.74 per cent.
Volatile matter .....	14.71 per cent.
Fixed carbon .....	57.08 per cent.
Ash .....	24.47 per cent.
B.t.u. per lb. of coal dry .....	11,190
B.t.u. per lb. of coal as fired .....	10,771
Type of boiler—Babcock & Wilcox.	
Type of stoker—Green chain grate.	
Horsepower of boiler .....	600
Grate surface .....	132.5 sq.ft.
Pounds of coal burned per square foot of grate surface per hour .....	20.52
Horsepower developed .....	641
CO <sub>2</sub> at damper .....	11.6 per cent.
Combined efficiency of boiler and furnace....	73.3 per cent.

## TEST NO. 5

Fuel—Arkansas semibituminous.	
Fuel analysis—	
Moisture .....	1.77 per cent.
Volatile matter .....	15.91 per cent.
Fixed carbon .....	53.78 per cent.
Ash .....	28.54 per cent.
B.t.u. per lb. of coal dry .....	10,537
B.t.u. per lb. of coal as fired .....	10,351
Type of boiler—Babcock & Wilcox.	
Type of stoker—Green chain grate.	
Horsepower of boiler .....	600
Grate surface .....	132.5 sq.ft.
Pounds of coal burned per square foot of grate surface per hour .....	25.6
Horsepower developed .....	743
CO <sub>2</sub> at damper .....	11 per cent.
Combined efficiency of boiler and furnace....	71.1 per cent.

## TEST NO. 6

Fuel—Texas bituminous.	
Fuel analysis—	
Moisture .....	4.48 per cent.
Volatile matter .....	33.48 per cent.
Fixed carbon .....	35.38 per cent.
Ash .....	26.76 per cent.
B.t.u. per lb. of coal dry .....	10,255
B.t.u. per lb. of coal as fired .....	9,796
Type of boiler—Babcock & Wilcox.	
Type of stoker—Green chain grate.	
Horsepower of boiler .....	500
Grate surface .....	137
Pounds of coal burned per square foot of grate surface per hour .....	27.87
Horsepower developed .....	724
CO <sub>2</sub> at damper .....	10.6 per cent.
Combined efficiency of boiler and furnace....	66 per cent.

## Efficiency as Applied to Mining

BY HUGH ARCHBALD\*

*SYNOPSIS—The basis of efficiency work, which is the increasing of the amount of work of the individual and the proper arrangement of that work, is as applicable to mining as to manufacturing. The means used for accomplishing this is by keeping simple records and timing the details of each operation.*

Gantt, in the opening sentence of his work entitled, "Work, Wages and Profits," makes the statement that "the greatest problem before engineers and managers today is the economical utilization of labor."

The greatest waste in mining is the waste of time. The proper balance between the efforts of each workman is not maintained, so that all suffer under unnecessary delays. As an instance a tracklayer may be sent to fix a certain piece of track without any definite instructions based on investigation as to how much work needs to be done and how long it is going to take. The result is that the man starts for his work and finds that someone has taken the rail-bender. He may first have to find out who took it. Then he must find that man to learn where he left it. Then he must get the rail-bender to the place where he is going to use it. Then he finds that he will need some ties; so he must hunt around for them and wait for a trip to get them to the place to be fixed. Finally

after much wandering around he can get to work. A mine is a friendly place and one can get into a conversation at any time; so any man wandering around will stop often to chat. If he is being paid by the day, all these talks are at the expense of the company.

It is part of the duties of the supervisory force of a mine to see that the material needed on any job is at the place where it is to be used before the workman is sent to do it. Yet too often scorn is expressed for the workman who cannot do all his own planning. A separation should be made between the investigation of and the planning for the things that need to be done and the actual doing of them. No man should be turned loose in a mine to work out his own salvation. It is probable that the high rates which exist generally for piece-work in mines are due to this attitude of turning a man loose, combined with the attitude that as soon as a price is fixed for any piece of work it does not concern the interest of the company to help the man earn his living. On the contrary it is to the interest of the company just as much as seeing that a day's work is done for a day's pay. It is part of the organization of work.

### COSTS MAY BE REDUCED

It is rather a delicate matter to suggest to any man that the organization which he has for accomplishing work is not the best. He is likely to be offended. And yet it is a fact that costs can be reduced and outputs increased in many places merely by putting into effect a better or-

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ganization. It is a problem that has been successfully attacked in the manufacturing field by Taylor, Emerson and other leaders. Sooner or later the problem will be taken up as generally in mining as it now is in manufacturing, and the same results will be obtained.

Many kinds of machines are manufactured and offered for sale, each one differing in some way from the others. The consequence is that much is written about machines, and they are the subject of many discussions. In contrast, organizations are not for sale, are not easily transportable and have not as great a variety.

The proper equipment of a mine is of primary importance. Work cannot be done without tools. And it is not to be recommended that supplies should be ordered without discussion and due consideration. But the material cost for mining coal is one-fifth or less of the labor cost, and yet it seems often as if it received *the majority of the attention*. There seems to be an idea, not alone in mining but in other lines of work, that men can be employed almost without limit and the work turned out in proportion to the number employed. It is not so; there is a certain balance between the number of men and the equipment even in the simplest of mines.

At one mine the number of loaders employed was reduced about 50, and yet the tonnage was increased 300 tons a day. Before that, the cars had been spread so thin over the number of men that the company had not been getting the full number of cars for a day's work. And when a limited number of cars is spread over too large an area, there is a loss in the efficiency of the transportation units. At another mine where it was desired to increase the daily tonnage over the 600 tons a day which *were being* mined, advertisements were run in the papers for loaders. On counting up the number of loaders, it was found that over 170 were already employed and that they were not getting enough cars to load to be able to earn a day's wage. The reason for the inability to increase the tonnage lay in a different direction from the number employed.

The simplest proposition in mining is that where the miner either digs and shoots the coal or, blasting it from the solid, loads it into the mine car himself, and where the car is taken by mule power over a short haul to the tippie. In this case as there are only two classes of work and so only one point of contact between classes, there is only one point that needs constant supervision—that between the miners and the driver to maintain the proper balance of work. Moreover, the miner has more than one thing to do. When he is not loading coal, he is getting coal ready to load, so that delays on the part of one set of men are not as important as where a greater subdivision of work exists.

It may seem like stating things with which everyone is familiar to call attention to some of the things in mining, but the true significance of some of the relations is not appreciated.

#### WORK MUST BE PLANNED

Efficiency work means the following up of each man and the arrangement of work so that each man can do his best. Under it, the management is expected to know all that goes on. The recommendation which was given for a track-layer—that all that was needed was to give him a job and he would find his work—does not prevail in efficiency work. That track-layer may have been excep-

tional, but for the ordinary man the work must be planned out.

When machinery is used to cut the coal, three elements are introduced, and even more than three, so that the supervision is not so easy a matter. With undercutting machinery it is necessary to watch that the haulage and the undercutting and the loading come out even in order to get good results. In this case there is more than one point of contact, as the number of classes of work is increased.

With pick coal mining, a miner can dig coal while the cars are being changed. With machine mining, the loader must lie idle between cars. Therefore it is best to have the cars changed quickly, for idleness breeds idleness. When there is a long time between cars and the men have to sit in the cold, moist air of the mine, they get stiffened up and do not load fast nor pitch into their work with vim.

It is a fact that where men have plenty to do they work better than where they do not have enough. One morning in a mine I passed two men playing checkers while four others sat around wrapped up in their overcoats, watching them. The mine foreman, who was along with me, commented after we had passed them upon the fact that it was easier to get men to load coal on another road in that mine where the men got more cars than on this road. On the other road the men would fight over cars and come in early in the morning and stay late at night loading coal, while on this road the opposite was true, the men going home as soon as they had loaded one or maybe two cars. In support of this remark, he told me that a few days before he had found two loaders fighting over a car, one of the men asserting his right to the car because, as he said to the other, "You had 13 cars yesterday and we had only 12." The men on the other roads were only getting twos and threes.

It is a result to be expected, for it takes a man about 20 min. to load one ton of loose coal. If he loads four tons in a day, he would only be loading 80 min. He might have to stand three props for these four tons. With split props in a 4-ft. vein it takes hardly 5 min., more likely 3 min., to stand one, so that the man might work 95 min. in a day. That would leave 385 min. in an 8-hour day for a man to loaf around doing nothing. If there is bottom to take up or roof to take down to make height for a car, this loafing time might be reduced by 30 min. at a maximum, but that would leave 355 min., nearly 6 hours out of the 8 that the man is supposed to work.

When a man has to loaf that long, it is no wonder that he goes home as soon as he feels inclined. It is not good for the man. It is not good for the company.

There is the assumption in this calculation that the man can load the coal directly into the car without turning it over. It is best to have the rooms of such width that this can be done. There is always the question, too, of how much a man can do. The answer is generally given on a guess without any study of what actually is being done. One foreman guessed that at his mine one could hardly expect a man to load more than 4 tons of pick coal in a day. On examination it was found that 60 per cent. of his men were loading 4½ tons or better.

Just as the place to begin the cleaning up of a mine is at the face of the workings, in order that all that is gathered may travel always toward the pit-mouth, so,



too, the place to begin efficiency work is at the face. The essentials of mining are two things—shoveling and transportation. If there is no shoveling done, there will be no transportation; so the problem to tackle first is shoveling.

If there is any coal loaded into mine cars by machines, it is so small at present that it can be neglected. All coal is practically loaded by hand. The size and the shape of the shovel used by the men are subjects for consideration in efficiency work. At a mine where an attempt was being made to work a seam 27 in. in height and irregular to boot, all the men were paid by the day, the shovels being supplied by the company. No. 1 and No. 2 flat coal shovels were used, but as these seemed to have too long a handle to be convenient, a few shovels were specially obtained with a very short handle, one where the D-shaped part began almost at the end of the iron. In every other respect the shovel was the same. But these shovels did not work well, and so a return was made to the long-handled shovels that were first used.

The trouble was not in the length of the handle, but in the shape of the whole shovel. A man uses with difficulty a shovel in which the space between his hands is less than his shoulder width—preferably a little greater, about 22 in. What was needed in a low vein such as this,

is recorded the number of cars which were dumped over the tippie on each day in the two weeks. In the total columns are given first the total number of cars for the two weeks and beside them the total tons. The next column gives the average cars per day; it is merely the total cars divided by the number of working days in the period—in this case 14. The third column is the car weight of the loader expressed in tons and decimals of a ton. This is merely the total tons divided by the total cars. The last four columns are the essential ones.

The first is the column showing the attendance of each man expressed in the percentage of the number of days he sent out coal. As the men did not report for work at this mine and no record was kept of their attendance, it had to be assumed that they were at work on every day that a car was dumped having their check.

The second column is the car-weight efficiency. It was assumed in this case that, as some of the men regularly loaded their cars with 1 ton 13 cwt. (1.65 tons) of coal, all could do the same. This was purely a machine mine, and all the men were working under practically the same conditions; so each man's car weight was divided by 1.65 tons and the efficiency expressed in percentage. The highest car weight efficiency at this mine was 104; the lowest 72, or 1 ton 3.6 cwt.

TABLE 1. MARCH

Loaders*	Days														Cars	Total Tons-Cwt.	Per-Day Cars, Tons	Car Weight	Attend- ance, %	Car Weight, Eff.	Tonnage, Eff.	Total, Eff.
	16	17	18	19	20	21	22	23	24	25	26	27	28	30	31							
126	2	7	3	5	4	3	3	4	6	2	6	10	3	4	62	99-00	4.43	1.59	100	96	101	97
128	1	7	4	4	5	3	2	4	7	0	5	1	4	4	51	82-05	3.92	1.61	93	98	90	81.7
127	4	4	4	4	5	5	2	3	5	5	5	2	5	5	58	86-10	4.14	1.48	100	90	87	78.3
145	4	4	4	3	4	2	4	4	5	4	5	3	5	4	55	87-04	3.93	1.58	100	96	89	85.4
143	0	4	4	3	2	3	3	4	4	5	2	4	5	3	46	68-15	3.54	1.49	93	90	76	63.7
144	0	3	5	4	1	3	4	4	0	4	0	4	5	3	40	61-09	3.63	1.53	79	93	80	58.8
130	4	5	4	4	4	4	6	3	7	5	0	4	6	7	63	92-17	4.85	1.47	93	89	102	84.6
149	3	7	4	3	4	2	2	6	8	2	0	6	4	6	57	83-16	4.38	1.47	93	89	92	76.2
139	3	5	3	4	4	4	3	4	9	3	7	5	4	0	58	93-02	4.46	1.60	93	97	102	92.0
140	3	5	4	4	3	4	4	1	0	3	0	5	3	1	40	66-15	3.33	1.67	86	101	80	69.5
129	6	5	5	3	3	3	4	4	1	2	1	4	4	6	51	75-11	3.64	1.48	100	89	77	68.5
141	6	4	6	3	3	3	3	5	0	3	1	5	4	5	51	77-08	3.92	1.52	93	92	85	72.7
132	3	5	4	4	4	3	4	4	5	5	7	4	2	3	57	84-11	4.07	1.48	100	89	86	76.5
133	2	5	4	4	4	4	3	3	6	7	6	3	3	3	57	84-18	4.07	1.49	100	90	94	84.6

\* In fourth left heading.

where it is hard for a man to crowd himself in and where he would have to shovel with the blade vertical, was a scoop-shaped shovel having a low lift and a quick rise from the blade to the handle, so that the man could get his hand near to the load. The shovel that was being supplied had all the faults it could possibly possess. With a scoop, the men could pitch the coal about 12 ft. as against 9 ft. with the flat coal shovel—a gain in shoveling efficiency.

#### MEN SHOULD BE TREATED AS INDIVIDUALS

There is one idea to be got rid of in starting efficiency work, and that is the consideration of the workmen as a mass. When one goes to a mine and begins to ask questions, the answers are often in the form "the men this" and "the men that," without specifying which particular men. The men in the mine should be treated as individuals, and after records have been made of the work of each one, sum totals showing the whole work can be made. The results will often be different from the guesses upon which the work had been proceeding.

As an example of the kind of records which can be made, Table 1 is given, which is the record of one heading in a mine for a period of two weeks. At this mine, which is a bituminous mine, with a seam of coal about 4 ft. in height, the men are paid by the ton. In the first column is given the number of the loader. Opposite each number

The tonnage efficiency was calculated on a basis of a task of 7 tons a day. As the price per ton was 42c., 7 tons would give \$2.94 as the earnings per day. Since in other regions the union scale calls for \$3 a day as the amount a miner should earn, it was considered that 7 tons was a good basis, giving, as it does, almost \$3. The highest tonnage efficiency was 134, while the lowest was 48. Twenty men had 100 per cent. or better; that is, they sent out over 7 tons on each day they were at work.

#### ON WHAT DOES EFFICIENCY DEPEND?

As the total efficiency of a man is dependent upon the regularity with which he sends out coal and the manner in which he loads his car, the total efficiency is the product of the attendance, the car-weight efficiency and the tonnage efficiency. As these are here all expressed in percentage, the last column is the product of multiplication of the three preceding ones. One man at this mine had an efficiency of 112, while his next-door neighbor, who was in attendance an equal number of days, had 41—quite a contrast!

Tables 2 and 3 show a summing up of all the sheets of the individual workers for this two weeks at the same mine. Table 2 shows the division of results according to headings. It is self-explanatory, column 1 being the name of the heading; column 2, the total number of cars from that heading, this being divided in two cases accord-

ing to the work; column 3, the total tons; column 4, the sum of the number of days that the various men worked; column 5, the product of the division of column 2 by column 4; column 6, the product of the division of column 3 by column 4; column 7, the average car weight for that road. The standard car weight at the bottom means that at this mine the men were not paid for any weight which they might have on their car above 1 ton 15 cwt. (1.75 tons). The purpose of making this sheet was to find out where the men were getting the most cars and where the tonnage was greatest per man, as well as the car weight. Tonnage might be low on account of a poor machine runner or some other cause which would be discovered after investigation.

TABLE 2. SECOND HALF MARCH, 1914

Heading	Cars	Tons-Cwt.	No. of Man-Days	Cars per Man-Days	Tons per Man-Days	Average Car Weight*
3C.....	1185	1887-17				1.59
3C pillars...	234	362-07	67	3.50	5.41	1.55
3C rooms...	951	1525-10	263	3.62	5.80	1.61
4C.....	837	1321-11	236	3.54	4.97	1.58
5C.....	195	296-03	60	3.25	4.94	1.52
3L.....	1515	2248-17	343	4.42	6.56	1.48
3L pillars...	460	629-03	109	4.22	5.77	1.37
3L rooms...	1055	1619-14	234	4.52	6.92	1.53
4L.....	746	1144-01	185	4.03	6.19	1.53
4R and dip..	298	452-17	87	3.43	5.20	1.52

\* Standard car weight 1.75 tons.

TABLE 3. SECOND HALF MARCH, 1914\*

Heading	Cars	Tons-Cwt.	Ave. Dist. Hauled	Tons—1000'	No. of Mules	Tons—1000' per Mule†	Grade‡
3C.....	1185	1887-17	1500	2830	3	943.3	3%
4C.....	837	1321-11	1780	2350	2	1474	4½%
5C.....	195	296-03	2020	598	3		
3 Left.....	1515	2248-17	1090	2450	2	1225	1½%
4 Left.....	746	1144-01	350	400	1	400	1½%
4R and dip..	298	452-17	450	203	§	203	

\* Fourteen days worked in the second half of March.

† The standard haul for a mule is 100 tons 1000 feet per day. One mule should haul 1400 tons 1000 feet on a level road.

‡ 1.2% grade in main heading.

§ 2½-ton motor.

Table 3 is a further summation of the work. This was made to give a comparison between the transportation units used in gathering the coal up to the point where it was taken by the main road motor. As the work of getting the cars to the men should not be judged by the number of cars that come from a road without considering the conditions under which the work is done, the grades encountered are marked.

The general standard for mule haulage is that one mule can haul 20 ton-miles in a day; that is, a power equivalent to that required to haul one ton 20 miles or 20 tons one mile on a level road. This is equal to hauling 100 tons for 1000 ft. It will be seen from this transportation sheet that the two mules hauling to 4C and 5C headings are exceeding this standard, hauling 1474 tons a distance of 1000 ft. for the 14 days, part of the haul being on a 4½ per cent. grade. This is good work. In contrast is the work of the motor, which was doing only 203. It showed that the motor was not being used to its full advantage, though needed for a dip heading, since it was doing less than a mule. As a side light on the motor, it was found that the son of the boss was running it.

The examples shown for a mine are given for only two weeks. The application of efficiency principles means the keeping of continuous records. There are many forms that can be used, but the essential is that they shall be the record of each individual and not the record of a mass.

They may seem so simple as to be hardly worth keeping, but good use can be made of them. Bookkeeping is done for all money expended, whereas little is done for labor ex-

pended, but it is just as necessary. These records should be in the form of journals and ledger accounts.

As to the saving in dollars and cents that can be made, it runs in all directions. Perhaps as simple as any is the saving in arguments. There is nothing so deadly to an argument put up by a poor workman that he cannot make a day's pay as the fact, which he soon learns, of there being a complete record of his work in comparison to the men around him.

Then, too, it will be frequently found that 75 per cent. of the coal is sent out by 50 per cent. of the men. If the other 50 per cent. of the men were brought up to standard, normal output, the total output would be increased 50 per cent., with a consequent reduction in cost. But when an attempt is made to increase the output, it is a good plan to know in what particular each man falls down. On the sheet shown in Table 1, loader No. 127 got out less coal than No. 145 though he loaded three more cars, because his car weight was 2 cwt. less. At that he was 0.17 below the standard. This equals 11 per cent. of the weight on the car. His loading of a full car would decrease the transportation cost on his cars 10 per cent. If the transportation cost is 15c. a ton, this is a saving of 1½c.

Continuous records are particularly useful in any mine where allowances have to be frequently made on account of the dead work due to irregularities in the coal. As to the labor involved in keeping up records, one such as is shown in Table 1 can be posted each day in about 15 min. for each 100 men. The compilations at the end of the two weeks take about half a day.

## Of Interest to Miners

BY JOHN MAJER\*

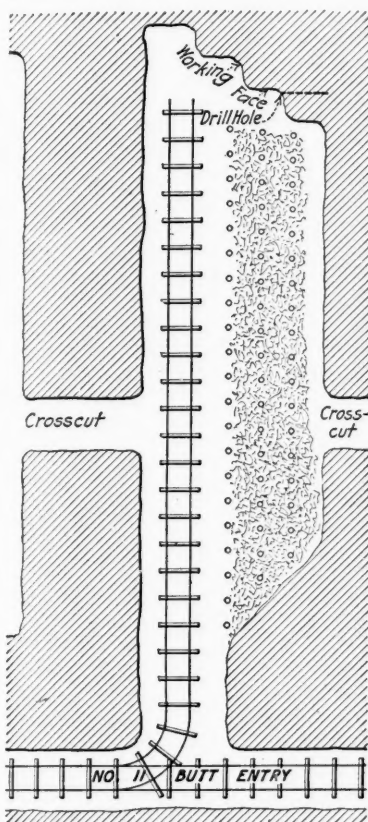
I was conversing with a friend a few days ago, and in speaking about mining laws he stated that at the mine where he was employed they were "compelled to use only permissible powder for blasting the coal" and complained that it "broke the coal too fine," which meant a great loss to the miner because he was paid only for lump coal. Frequently, also, a shot would misfire and the miner must then go home without having any coal ready for the next day. But the "greatest trouble," he claimed, "was to keep sufficient earth on hand for tamping the holes." Each miner was "compelled to provide his own earth for tamping," which was a requirement of the mining law.

At this point I interrupted him, to tell an incident in my own experience that, I believe, will be of interest to all COAL AGE readers. I had been working three years in the mine at the time the accident happened that I am about to relate. Previous to that time I had worked continuously as a miner in gaseous mines. My experience of nine years in mining coal convinces me that there is little fear of danger if miners will stop fooling with gas feeders and obey the mining law.

The mine where I was working was well ventilated and operated in full compliance with the law. The coal was 3 ft. 2 in. high and overlaid with a solid roof. There was a "binder" near the bottom of the seam, varying from 1 to 4 in. in thickness, and beneath this was 5 in. of coal. I found that it always took more powder to break down the coal when the shot was mined below than when the

\*Garrett, Penn.

mining was done in the top of the seam and the shot placed below. For this reason I mined all my coal in



PLAN OF ROOM, SHOWING THE LOCATION OF THE SHOT

the top of the seam, which gave better coal and made it easier to pick out the binder, which was then easily separated from the coal in large pieces.

In the accompanying sketch I have shown the condition that existed at the face of the room where we were working, at the time the accident happened. The room was driven about 50 ft. ahead of the crosscuts shown in the figure. We took out the coal, as indicated, in steps about 6 ft. wide and  $3\frac{1}{2}$  ft. deep, mining the coal at the top and placing the shots in the bottom of the seam. At this time, we had altogether about three cars of coal blasted down and ready to load when I suggested eating our

dinner. My buddy, however, had drilled the hole shown in the right-hand corner, at the face of the room, and he wanted to shoot this hole and then take his dinner while the smoke was clearing away.

While I started to eat, he prepared a charge of 6 in. of a 4-F grade of black powder. I offered to assist him, but he preferred to do it himself; and when he was ready and called "Fire" we both hid in the crosscut between this room and the next and waited for the shot to go off. This shot failed to break the coal, however, blowing out the tamping with a whistling noise ("squealer"). I remarked that he had not used enough powder to break the binder. After eating our dinner, we examined the hole together, and I suggested that we load out the coal already shot down before shooting the hole again. My buddy was mad, however, and persisted in drilling and firing another hole in the middle of the seam.

While he was drilling this second hole, I prepared a charge of 7 in. of powder and after inserting this in the hole tamped it with coal slack. When this was done and the shot lighted we both hid, as before, in the crosscut. Whether the result was due to there being two holes or whether the first shot had sprung the coal I do not know, but the explosion filled the room with flame for several seconds, the flame extending to within 10 ft. of the crosscut. I shall remember the incident all my life as we were both terribly frightened. I want to urge, here, every miner never to fire a shot until all fine coal, slack and inflammable substances of any kind whatever have been cleared away, especially any powder remaining after

charging the hole. I want to suggest, also, as a means of safety, that coal operators should furnish their miners with enough clay to tamp every shot. Coal-dust should never be used for this purpose.

### Coal Used by Power Plants

R. E. Horton in *Engineering News* tabulates some computations of the yearly coal consumption in tons under various conditions and based on the use of 1 lb. of fuel per horsepower-hour:

Method of Operation	COAL REQUIRED PER HORSEPOWER-YEAR, THE AMOUNT OF COAL USED WHEN RUNNING BEING TAKEN AS ONE POUND PER HORSEPOWER-HOUR			
	Gross Tons, 2240 Lb.		Short Tons, 2000 Lb.	
	310 Days	365 Days	310 Days	365 Days
10 hr. per day, no banking.....	1.38	1.63	1.55	1.83
10 hr. per day plus $\frac{1}{3}$ for banking.....	1.84	2.17	2.07	2.43
12 hr. per day, no banking.....	1.65	1.96	1.86	2.19
12 hr. per day plus $\frac{1}{3}$ for banking.....	2.21	2.61	2.48	2.92
24 hr. per day, no banking.....	3.32	3.91	3.72	4.38

When the consumption per horsepower-hour is known or assumed it can be multiplied by the figures in the table. For example: A plant runs 10 hr. per day and 310 days per year, generating an average of 500 hp. It uses  $21\frac{1}{2}$  lb. of coal per hp.-hr. and needs an allowance of  $\frac{1}{3}$  for banking. Coal costs \$3.50 per gross ton. From the table, the proper unit consumption per horsepower-year is 1.84 gross tons. Consequently

$$2.5 \times 1.84 \times 500 \times \$3.50 = \$7735 \text{ annual cost.}$$

Sometimes it is necessary to know how many tons of ash will have to be disposed of each year; then the decimal proportion of ash in the coal can be substituted for the price per ton. For 15 per cent. ash the foregoing example shows

$$2.5 \times 1.84 \times 500 \times 0.15 = 345 \text{ gross tons.}$$

### Rhode Island Anthracite

Rhode Island anthracite has long been a puzzle to mining men and capitalists. Is it a fuel or can it be best used for making refractory linings for blast furnaces? After a study of the Rhode Island anthracite field, the character and qualities of the coal and the results of tests of its use in house and steam furnaces and in the making of briquettes and coke, the U. S. Geological Survey has published a preliminary report by George H. Ashley in Bulletin 541-F.

The coal has been known in Rhode Island for 150 years or more and during the last 100 years scores of attempts have been made to mine it commercially in many places. With one exception these attempts have not been successful, and most of the mines have been abandoned within three years.

In general it has been found that Rhode Island anthracite is difficult to handle, and that the cost of handling, on account of the large quantity required to produce a given amount of heat and the higher percentage of ash, will be greater than that of other coals; furthermore, when burned it can produce only from 40 to 80 per cent. of the heat units produced by the coals with which it necessarily must compete. In general it may be said to show about two-thirds the heat value of Pocahontas coal and when the extra cost of handling the coal and ash is reckoned it may be estimated that Rhode Island anthracite will yield not over one-half the heat afforded, dollar for dollar, by Pocahontas coal.



## A Powerful Tractor for Heavy Delivery Service

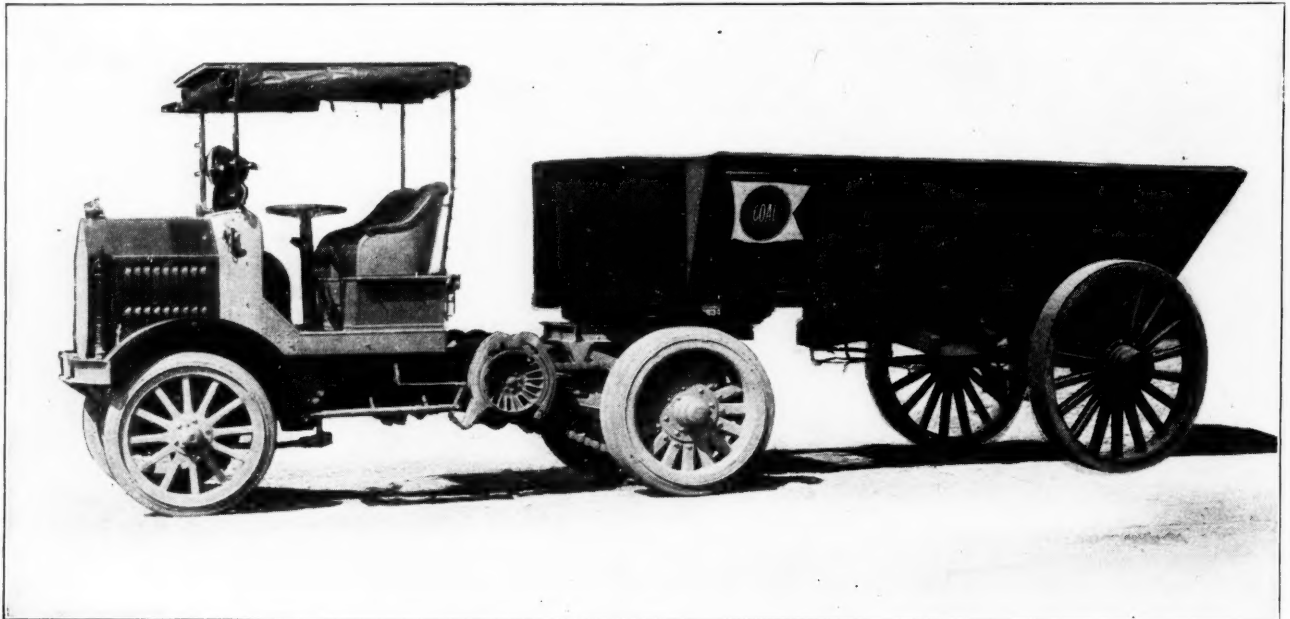
*SYNOPSIS—Description of the new Knox tractor, which embodies the latest ideas in heavy motor construction. The machine transports a load of 10 tons and is equipped with electric starter, a new type of direct and hydraulic brakes and several other novel features developed after considerable experimentation.*

A motor vehicle capable of carrying a 10-ton load with 60% of the weight on large steel-tired wheels has just been put on the market by the Knox Motors Co., of Springfield, Mass. For several years this company has been manufacturing a three-wheel tractor in which the front end of an ordinary heavy truck was carried on a platform over the rear driving wheels of the tractor.

carried by the rear wheels of the trailer. The wheel-base of the tractor itself is 108½ in.

The front wheels have 36x4-in. solid tires, and the driving wheels have 38x6-in. solid double tires. The width of the face of each section of the driving-wheel tires is about 4½ in., or 18 in. for the two wheels. Thus the total weight imposed on the road surface by the driving-wheel tires of the tractor when carrying a fully loaded trailer is about 800 lb. per in. of width. Notwithstanding the length of the whole vehicle when the trailer is attached, it can turn in very crowded quarters, as the front wheels are so designed that they can be skewed to a sharp angle, and the center plate on which the front end of the trailer rests is so designed that the tractor can swing to a sharp angle with the trailer and not foul anything.

By an ingenious arrangement of springs, the trac-



SIDE VIEW OF THE TRACTOR WITH COAL WAGON ATTACHED

This machine has now been redesigned with two wheels in front instead of a single wheel and with a number of novel features. The illustration herewith shows one of the new type tractors equipped with a heavy truck as a trailer. The trailer vehicle may be of any type desired. The front end of the trailer vehicle rests on a turntable over the rear wheels of the tractor.

### GENERAL DETAILS OF NEW TRACTOR

The new tractor, fully equipped but without a trailer, imposes a load on the front pair of tires of 3750 lb. and on the rear tires of 4700 lb. When the trailer is attached there is no increase of the load on the front tires, but with an ordinary truck about 40% of the weight of the trailer with its load is carried by the driving wheels of the tractor and 60% by the rear wheels. If the trailer carries a paying load of 20,000 lb. and its weight empty is 4000 lb., the total weight on the driving wheels of the tractor would be about 14,400 lb., and about the same weight would be

tor machinery and the driver are carried easily and smoothly over rough roads and left entirely free from the jar of the heavy load carried on the trailer and the driving wheels. The load on the center plate which supports the front end of the trailer is carried by very stiff and heavy springs to the driving-wheel axle, while flexible cantilever springs 48 in. long, entirely independent of the heavy springs, support the rear of the tractor chassis and have their rear ends resting in slideways under the rear axle. Thus the rear axle is isolated from the tractor chassis, and while it is maintained in line by strut rods it is free to move up and down, equally or unequally as to either of its wheels, without motion of the chassis. This construction should not only add materially to the comfort of the driver, but should be of advantage in relieving the engine and propelling machinery from the jar and vibration inevitable when a very heavy load is carried on a freight truck, besides relieving the tractor chassis from twisting stresses.

A very interesting feature in the design of the propelling machinery is the interlocking differential lock. As every driver of a motor car knows, the differential gear through which the rear axle is driven, while absolutely essential to enable the vehicle to turn corners, is a very serious drawback to the effective traction of the machine on slippery or muddy roads. If either driving wheel slips, the entire power is transmitted through the slipping wheel, while the other driving wheel remains stationary just at the time when its effective traction is most needed.

The differential lock is a mechanism by which the driver, by pressing down a lever in the floor of the cab, can lock the differential gears so that the two driving wheels are compelled to turn together as if the rear axle were one rigid piece. If, however, this lock were thrown into the gears with the engine running and one driving wheel slipping, perhaps at high speed, breakage of the gears would be inevitable. In order to prevent this, the mechanism by which the differential gear is locked is connected with sliding bars which move the transmission gears and throw the transmission into neutral position before the differential lock can engage. Of course, when the transmission gear is thrown to neutral, the slipping rear driver in contact with the road instantly stops. The mechanism by which this result is effected is quite similar in its general design to the familiar mechanical interlocking apparatus for railway switches and signals. After the driver has locked the differential, he can then set the speed-change gear to any position he desires.

#### BRAKE ARRANGEMENT

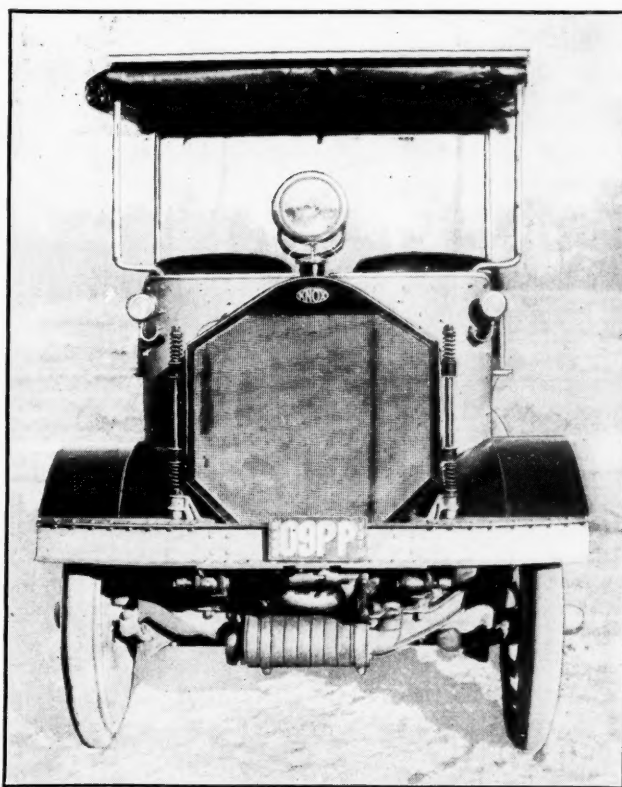
A feature of truck design which has given much trouble with trucks operated in hilly country is the braking system. As every engineer knows, a brake is merely a mechanism for converting the inertia of a moving vehicle into heat. On an ordinary touring car weighing 1500 to 4000 lb. the usual type of brake, consisting of a contracting band on the exterior of a brake drum on the rear axle with an expanding band on the inner surface of the same drum, works satisfactorily. The amount of heat generated by the brake is not great enough to cause overheating of the parts, and on long and steep hills careful drivers generally use the engine to assist in retarding the car. When a heavily loaded truck is descending a long hill, however, the number of foot-pounds which must be converted into heat between the top of the hill and the bottom becomes so great that, unless sufficient surface is given the brakes and sufficient provision made for the dissipation of the heat, difficulty is apt to be experienced.

The service brake on the new Knox tractor is designed, not on the lines of the ordinary pleasure-car brakes, but on those of railway-car braking practice. A cast-steel drum, 14 in. in diameter and 4-in. face, is secured to each end of the jackshaft. A foot lever in the driver's cab enables him to bring a pair of cast-iron brake shoes in contact with the faces of this drum. The driver can automatically lock this brake lever in any position he desires. The inner surface of the drum has a large number of projecting ribs for radiating the heat developed. The cast-iron brake shoes are as easily removable and about as cheap to renew as the brake shoes on a railway car. As the jackshaft turns in fixed bearings and is not variable in position with reference to the chassis, as is the wheel of a railway car, the brake shoes can have a very close adjustment, so that very small motion of the foot

lever is required to apply or release these service brakes.

In addition to this effective service brake, an emergency brake, operated by hydraulic power, is applied to the interior of two heavy drums 20 in. in diameter and 6½-in. face, secured to the rear axle, the driving spocket forming part of the same drum. The hydraulic pressure is transmitted by a flexible pipe from the pressure pump in the driver's cab to the brake-operating cylinder on the rear axle. Thus the rear axle may move as it pleases with reference to the chassis of the tractor without affecting in any way the adjustment of the brake.

The hydraulic pump applying the brakes is operated by a hand lever convenient to the driver's seat. Three or four quick strokes of the pump are sufficient to bring the expanding brake bands in contact with the drums on the



FRONT VIEW OF TRACTOR

driving axle. The ratio of the hydraulic pump plunger and of the brake-band setting plunger is 10 to 1, enabling the driver to exert an enormous braking force on the driving axle. This brake pressure is maintained until the handle of the hydraulic pump is moved forward to the end of its travel, when a valve is released, allowing the liquid to flow back to the reservoir, when the springs withdraw the brake shoes from contact.

#### SPEED CONTROL, OILING AND ELECTRIC STARTER

Another interesting departure from ordinary motor-truck design is the omission of the governor generally applied to motor trucks to limit the speed at which the vehicle may be run. Instead of applying a separate governor, the designers of the motor used on the tractor have adopted such proportions that at a speed of 1000 r.p.m. the horsepower of the motor begins to rapidly fall off, in whatever gear the transmission is running.

The gear ratios of the transmission are such that with the motor running at 1000 r.p.m. and the transmission

in high gear, the tractor will run at 9.4 mi. per hr. In intermediate gear the speed of the tractor is 3.9 mi. per hr. In low gear the speed of the tractor is 1.6 mi. per hr.

Another interesting and important mechanical feature is the use of oil under pressure for lubrication. Lubricating oil is forced to the main bearings by a small gear pump which delivers the oil under a constant pressure of 30 lb. per sq.in. through holes drilled into the center of the main bearings. This is the system of lubrication now in use on the bearings of large marine naval engines, where the service is most severe. Experience has shown that under these conditions a constant film of oil under pressure is maintained between the shaft and its bearings, and wear is practically eliminated.

The truck is equipped with an electric lighting and starting system. There is little doubt that this will be considered an economic necessity in future motor-truck design. If hand-cranking must be used to start the motor, drivers will inevitably keep the engine running idle whenever the truck is standing rather than undergo the exertion of cranking it; thus idle running involves a constant waste of fuel and keeps the engine hot. With an electric starter the driver stops the engine whenever the truck stops, knowing that he can start it by pressing a button.

The motor of the tractor has four 5x5½-in. cylinders, cast in pairs and having the valves placed in the heads, which are bolted to the cylinders. The gasoline supply is contained in a 25-gal. reservoir and is fed by a vacuum system to the carburetor. Four gallons additional is carried as an automatic reserve supply.

Finally, it may be noted that the engine has been specially designed with a view to work in wet and muddy regions. The carburetor, magneto, generator and starting motor are all placed high upon the engine, at least 31 in. above the ground level, so that in case of necessity the machine can be run through water of a considerable depth without being put out of commission.

### Extracts from a Superintendent's Diary

When our lawmakers perfect and put into operation suitable laws covering minimum wages, employers' liability, old-age pensions, etc., they will have made it possible for a superintendent to follow the dictates of his conscience at all times without violating general company rules governing rates of wages, maximum number of employees in different departments, etc.

Company auditors in general offices far removed from the base of operations can think only in terms of averages, and they have perfected systems based on averages that enable them to pick out all force-account and payroll variations, no matter how small the variation in wages or number of employees may be.

But model cost sheets with all the deadheads eliminated make no provision for tiding over faithful men who through circumstances often beyond their control, such as sickness or accidents out of working hours, are obliged to live somehow without working, often for long periods of time; nor do they carry pensions for men grown old in the service, nor for widows and orphans of men killed through their own carelessness, but killed nevertheless, and at inopportune times, often with cupboards left bare.

When the time arrives, then, when no more cripples or pensioners can be carried on the roll without exceeding the maximum and thus attracting the attention of the auditors, the superintendent's troubles will begin; I know whereof I write because my troubles began last month.

There has never been a time since I was granted a superintendent's title that I have not been contributing out of my personal income a small amount at least toward some unfortunate family's support; lately the demands (all of them worthy of generous response) have become so numerous that I have stretched my conscience almost to the breaking point by throwing some of the burden on the company, just as if the company had made regular provision for such emergencies.

It's all very well to say that Dick Brown lost his life through his own carelessness and deserved just what he got, but so long as Dick Brown's family remains on the verge of starvation within our camp the manner of Dick's death can have little effect on our treatment of his family. Likewise it's a simple matter to say that Old Man Smith would not have been penniless if he had persistently saved a very small portion of his savings over a period of years and therefore deserves little sympathy, but so long as Old Man Smith remains in our camp we are not going to sit calmly by and watch him starve, sympathy or no sympathy.

Friends of unfortunates are always willing enough to head subscription lists and take them through the camp, and most of our citizens do subscribe liberally to all such appeals; but the necessity of aiding by private subscription men grown old in a company's service has never seemed just to me. It is possible to use a certain number of cripples and old men to replace boys employed as trappers, tippie hands and the like, but here again one's conscience asserts itself, and the man who can serenely watch a crowd of broken-down old men and cripples forced into service that they may drive away the wolf at their doors would soon bring his company into bad repute.

I have just been reading an article dealing with compulsory old-age pensions, and the author characterizes all such legislation as a blow aimed at personal liberty; he sees in such legislation nothing but the secret workings of soulless corporations.

Evidently the author of that article never had his conscience put to a test by being called upon to create positions on corporation payrolls to take care of derelicts.

### Coal Output of China

From a recent report of the Ministry of Agriculture and Commerce at Peking it appears that the output of coal in the various provinces of China during last year was 9,272,000 tons, says *Commerce Reports*, divided as follows: Manchuria, 840,000; Hupeh, 100,000; Chihli, 2,160,000; Anhwei, 60,000; Shansi, 2,500,000; Shantung, 932,000; Honan, 900,000; Szechwan, 300,000; Kiangsi, 800,000; Hunan, 500,000; Shensi, 50,000; Kwangtung, 50,000; Kansu, 50,000; Yunnan, 30,000.

**Assumption of Risk by Miner**—Notwithstanding the legal duty of a coal operator to make safe miners' places of work, a miner assumes the risk of being injured or killed in walking under a defective roof in the main entry of a mine, after he has been warned against the danger and his attention has been specially called to the defect. (*United States Circuit Court of Appeals, Eighth Circuit; Pearson vs. Rocky Mountain Fuel Co.; 219 Federal Reporter 496.*)



# A British View on Our Export Opportunities--II

BY G. BREFFIT\*

*SYNOPSIS—This is the second and concluding article by Mr. Breffit. The ultimate prominence of the United States coals in the world's markets is now an accepted fact. The author also discusses the adaptability of our coals for export business and outlines a tentative scheme for entering the foreign markets.*

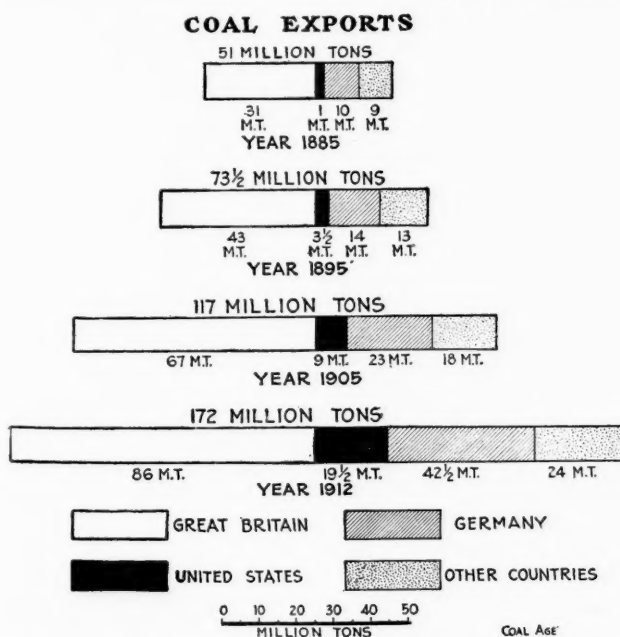
There is no doubt that America is destined to be the chief source of coal supply, and as soon as an export business from the United States is fairly commenced, the progress will be rapid. But a shop must be opened before customers come to buy, and at the present time foreign purchasers scarcely recognize this country as being in the market to sell.

As this export business grows, it will have its effect upon what has been best described as the "set of trade." New markets for the use of coal will be opened, while the

and 9, while groups 3, 4 and 10 (at no time of any magnitude) have remained almost stationary. This is the grouping that has been adopted by the statistical department of the English Board of Trade, the boundaries of each being roughly shown on the map.

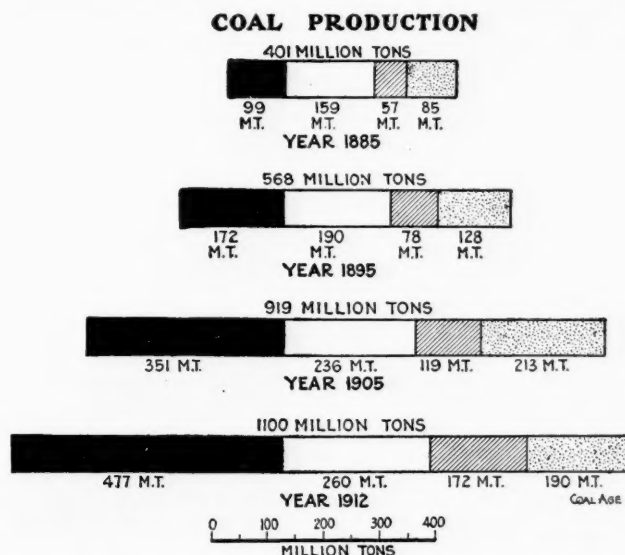
Export business should be cultivated. Although it is a healthy sign for a country to consume its own production of coal, the United States is really too dependent upon its home customers. An "equilibrium" is wanting, and as a result there is irregularity of work, which is bad for both employers and employed. Besides, regular work means cheaper coal, and in the long run it is the home consumers who benefit by this. Therefore an increase of exports becomes a benefit to the people and should be encouraged whenever possible by the state.

At first sight it would appear otherwise, as any addition to the vendors' list of customers would tend to strengthen prices, to the detriment of existing buyers; but this hardening tendency is more than compensated by the



transportation of coal itself will increase bunker requirements, and more coaling depots will be needed; in short, it is an example of business making business.

An illustration of the gradual change in the "set of trade," as applied to the British coal exports, will be found in the accompanying statement (Table D) showing the quantities and percentages exported to each group of countries every fifth year for the last half century. Some lesson is usually to be learned from statistics, dry though they may be, and the object in working out these particular results is to show how, as the coalfields of the United States and of the Far East have developed, the British trade with groups 5, 6, 7 and 8 has dwindled, finding its replacement in the increase with groups 1, 2



GRAPHIC REPRESENTATION OF THE WORLD'S COAL PRODUCTION AND EXPORTS

cheapening of production consequent upon more regular work, so that a coal owner could make larger profits without raising his price—or even in spite of lowering it.

Appended hereto is a statement showing the chief destinations of coal exported from Great Britain, Germany and the United States in 1905 and in 1912. It may be observed in this statement (see Table F) that the exports from Germany, although increasing annually to all countries, are chiefly in the direction of contiguous countries; exports to "other countries" being only from 3½ to 7 per cent. of the total.

Probably the ideal organization would be a coöperation of all the coal producers in the world, but this may be at once dismissed as entirely impracticable. Nor is it worth while to discuss the coöperation of all the producers in one country; the interests are too diffuse and the condi-

\*20 Broad St., New York City.

TABLE E. PRINCIPAL DESTINATIONS OF COAL EXPORTS (GIVEN IN THOUSANDS OF TONS)

To	1905			1912		
	U. K.	Germany	U. S.	U. K.	Germany	U. S.
Russia.....	2,578	955		4,047	1,486	
Sweden.....	3,178			4,116		
Norway.....	1,446			2,201		
Denmark and fisheries.....	2,333			2,867		
Germany.....	7,626			8,395		
France.....	6,732	1,349		10,191	3,008	
Spain.....	1,971			2,271		
Italy.....	6,413			9,180		
Egypt.....	2,243			2,926		
Brazil.....	1,044			1,626		
Argentina.....	1,784			3,365		
Belgium.....		2,499			5,282	
Holland.....		4,360			6,439	
Austria.....		5,948			10,838	
Switzerland.....		1,138			1,485	
Canada.....			6942			13,595
Mexico.....			872			345
Cuba.....			535			1,151
Other countries.....	10,128	582	670	13,260	2,106	2,598
	47,476	16,831	9019	61,445	30,644	17,689

tions too various, to be brought together in one line.

But to associate all the producers of one district, or even the producers of a particular class of coal in one district, is both feasible and worthy of consideration; and when the success attending the Westphalian scheme is reviewed it is surprising that such associations are so rare.

Control may be obtained in several ways, such as:

- (a) By purchase of the undertakings.
- (b) By amalgamation.
- (c) By pooling sales.
- (d) By convergence of sales to one office.
- (e) By purchase of the greater part of production.

(a) Entails an enormous capital outlay, even if the purchases can be effected at prices satisfactory to the buyer, which is unlikely.

(b) Cannot be hoped for to any large extent, owing to the difficulty in agreeing upon the valuation of each component part.

(c) Is only applicable either when the several interests

TABLE D—EXPORTS OF COAL FROM GREAT BRITAIN—TO THE 10 GROUPS OF MARKETS (GIVEN IN THOUSANDS OF TONS)

Year	1 Russia, Sweden, Norway, Den- mark, Germany, Holland, Belgium and Whale Fisheries		2 France, Spain, Mediterranean, Azores, Madeira, Canaries and St. Vincent		3 W. Coast of Africa, Ascension and St. Helena		4 British South Africa		5 E. Coast of Africa, Mauritius, Arabia and Persia		6 Indian Continent		7 Ceylon Straits, China, Japan, Austral- asia and Pacific Islands		8 N. America (Atlantic), Central America (Atlantic), Venezuela and West Indies		9 Brazil and Argentina		10 Pacific Coast of North and South America		Total
	Tons	%	Tons	%	Tons	%	Tons	%	Tons	%	Tons	%	Tons	%	Tons	%	Tons	%	Tons	%	
1860.....	2,452	34.7	3,029	42.8	33	0.4	27	0.4	89	1.2	146	2.1	308	4.3	710	10.1	204	2.9	77	1.1	7,074
1865.....	3,070	34.5	3,810	42.8	54	0.6	38	0.4	88	1.0	217	2.4	267	3.0	843	9.5	313	3.5	175	1.9	8,876
1870.....	4,038	36.1	4,960	44.3	50	0.4	14	0.1	87	0.8	250	2.3	315	2.8	819	7.4	445	4.0	200	1.8	11,178
1875.....	5,408	38.7	5,995	42.9	60	0.4	48	0.3	116	0.8	367	2.7	406	2.9	663	4.7	519	3.7	398	2.9	13,979
1880.....	6,213	34.7	8,299	46.4	125	0.7	168	0.9	146	0.8	655	3.7	632	3.6	782	4.4	562	3.1	309	1.7	17,891
1885.....	7,290	32.1	11,261	49.6	191	0.8	190	0.9	241	1.0	776	3.4	747	3.3	646	2.8	986	4.4	374	1.7	22,710
1890.....	9,252	32.1	14,766	51.3	361	1.2	264	0.9	282	1.0	686	2.4	747	2.5	449	1.5	1454	5.5	477	1.6	28,738
1895.....	11,044	34.8	15,334	48.3	266	0.8	252	0.8	286	0.9	805	2.8	660	2.0	492	1.5	1977	6.2	598	1.9	31,715
1900.....	18,108	41.1	21,068	47.8	625	1.4	708	1.6	254	0.6	100	0.2	765	1.7	182	0.4	1977	4.5	302	0.7	44,089
1906.....	21,735	39.1	27,114	48.8	457	0.8	197	0.3													55,600

all produce the same quality, in which case each is content to receive the same price as his neighbor, or when the variations in quality are so exactly represented by the variations in price that the results admit of no dissatisfaction.

(d) Is the simplest method, as it involves only the consent of individual operators to the principle and the assurance of a capable and trustworthy administrator. There is no disturbance of capital, no pooling, and no disclosure of internal affairs.

(e) Requires no "consent," and could be operated by anyone endowed with sufficient credit to make unlimited purchases. The actual cash for working capital (beyond payment of railroad freights) is not necessarily large, all depending on whether any longer credit is allowed to buyers than is obtained from sellers.

In any of these cases the principle sought is that of "selling from one office," in order that fluctuations in prices may be accommodated to the relation of supply to demand and nothing else, and so do away with the unnecessary competition which so frequently cuts prices needlessly.

In addition to this, the operator (or the administrator, as the case may be) could so handle his product as to be in a position to offer exceptional terms to consumers—particularly guaranties, under specified penalties, as to quality. Such a condition would be onerous to an individual coal owner, while it could be undertaken with comparatively little risk by a group of producers, or by the administrator, because of the varied sources of supply.

#### ADAPTABILITY OF AMERICAN COAL FOR EXPORT

The production of coal in the United States is not only very large, but is so varied in character that there is little doubt as to the ability of this country to supply, with a few exceptions, the entire demands of the world. The exceptions include:

(1) The high-grade smokeless steam coal, which has so far been found only in South Wales and which has a special market (where price is not of first consideration) in warships and mailboats.

(2) The very dry steam coal, verging upon anthracite, suitable for the manufacture of producer gas, of which there appears to be no supply in the United States.

(3) Coking coal. Of this there is a large production, but it is all needed in this country and none can be spared for export; particularly as the area is not extensive and at the present rate of exhaustion will be worked out in a comparatively short period.

But with the exception of the special demand upon No. 1, which this country does not produce, and on No. 3,

which is not for sale abroad, it appears that the United States has coal to offer suitable for every purpose and that it is only a matter of price, regulated by efficiency, as to what portion of the world's orders can be booked.

The classes of coal used and the proportions required vary considerably in different countries. From the point of view of quantity, the markets of France and Italy are, to the English merchant, of equal importance, both countries importing about 10 million tons of British coal annually, but there is much difference in the class of coal bought by each. Italy produces no coal, and the quantity imported from Great Britain is practically all Italy consumes, less than 5 per cent. coming from other countries. France, on the other hand, uses 35 million tons of native coal and buys another 10 million tons from Germany and other countries besides the 10 million tons from Great

Britain; so that French purchases are, to a greater or less extent, confined to selected qualities, while the Italian imports are fairly representative of the country's needs.

I would sum up the foregoing into three recommendations:

(1) Organize internally with the view of lessening competition and of economizing production.

(2) Please your customers by helping them to find out what best suits them; by giving them this, or the nearest approach to it possible, or, if you do not produce it, by getting it for them.

(3) Obtain all information of what is going on in other countries, statistical and otherwise; remembering that anything, no matter how trivial or apparently irrelevant, may have a bearing upon international competition.

### Some Notes on Fuel Consumption at San Francisco

The population of Oakland, with Berkeley and Alameda, is estimated to be 300,000 at the present time, and taking all the cities and towns situated on San Francisco Bay into consideration, the population is very nearly a million. San Francisco has an even climate the year around; its highest mean temperature is given as 61 deg., for September, and its lowest as 50 deg., for January. The average date of the first frost in autumn is Dec. 10 and of the last in the spring is Jan. 25. San Francisco is the financial center of the West and occupies eighth place for bank clearings in the United States; these amounted to \$2,624,428,532 in 1913.

RECEIPTS OF COAL AT SAN FRANCISCO (IN TONS)

Year	British Columbia	Australia	Great Britain	Japan	China	Washington	Oregon	Domestic Eastern	Rail	Grand Total
1906	311,099	72,638	37,215	.....	.....	110,670	42,975	11,455	.....	586,052
1907	205,956	387,740	18,582	73,398	.....	87,346	26,445	83,883	.....	883,550
1908	167,415	228,174	15,110	.....	.....	29,426	24,885	171,875	.....	655,801
1909	179,187	97,281	.....	5	.....	25,557	24,470	76,081	.....	402,581
1910	166,443	154,603	2,564	39,077	6,170	65,085	13,572	86,744	.....	534,238
1911	200,646	160,626	1,076	2,100	14	59,128	4,655	154,789	10,930	593,964
1912	173,753	94,439	.....	2,150	500	49,829	1,200	122,090	19,080	463,041
1913	40,297	89,579	200	80,222	800	66,344	950	126,668	47,250	452,310
1914	97,598	123,050	13,421	25,077	1,000	12,637	73	60,219	39,030	372,105

Oil has replaced coal for steam production on the Pacific Coast and nowhere to a greater extent than in California. In addition, coal has had to contend with the competition of electricity and gas here as in other places. Electricity is produced by water power, and for reserve power the companies are keeping steam plants that burn crude oil. The gas is produced and sold generally by the companies that sell electricity. The gas is now made from oil instead of from coal.

The marine department of the San Francisco Chamber of Commerce compiles an annual statistical report of all the coal brought into San Francisco harbor as cargo and of all that which enters by rail. The Oakland Chamber of Commerce does not compile statistics, and figures are not available for coal entering other ports of San Francisco Bay by rail. These figures as compiled are shown in the table herewith.

### Developments in Ocean Shipping Facilities

That some shippers are intending to enter overseas markets as a permanent thing appears in a recent announcement of ships being built to carry coal from Chesapeake Bay to Mediterranean ports. Two steamers,

each of 7500 tons' capacity, to be operated by the Coastwise Transportation Co., of Boston, have been chartered for six years in this service, and it is understood they will usually load in Baltimore. These ships will be 400 ft. long and 55 ft. beam, with engines amidships. The keels have already been laid at Camden, N. J., and one is to be ready in October and the other in December. Other ships are in process of construction, but are designed primarily for coastwise trade. Among these are the three steam colliers, of 5000 tons each, for the Pocahontas Navigation Co., which will be factors in the Pocahontas field.

### Situation in the Middle West

The more hopeful Indiana and Illinois operators feel that any change would be for the better, conditions now being at their worst. Current shipments are confined absolutely to orders, and in consequence there is little consignment coal on hand to disturb things, which is encouraging. There is also a renewal of activity in manufacturing and industrial circles in the Chicago district, which should soon reflect favorably on the coal trade. On anthracite, some orders have been placed at April storage prices, but there is no movement of consequence. The old-line companies are maintaining circular prices, but the independents make concessions to obtain orders.

### Conditions at Milwaukee

Summer retail rates on coal at Milwaukee went into effect on Apr. 1. Nearly all anthracite grades with the

exception of buckwheat now retail at 50c. per ton below the winter rate. Egg and stove sizes of anthracite are quoted at \$7.60 per ton instead of \$8.10, chesnut at \$7.85 instead of \$8.35, and pea size at \$6.55 instead of \$6.60. Buckwheat remains at \$5.25. On bituminous, Pocahontas sells at \$6 as against \$6.50 during the winter and Hocking Valley at \$4.75 instead of \$5.25.

With the exception of stove coal the supply of domestic fuel coal is ample; some dealers have been short on this grade and have been replenishing their stocks by rail. Some cargoes of anthracite now afloat at Buffalo will come forward as soon as navigation opens. Stocks of soft coal on the docks are a little above normal and the rate of shipment fair. Indications are that the movement for the coming season will be about the same as that of last year. It is the policy of Milwaukee coal-handlers to keep stocks replenished to the limit of storage capacity. Milwaukee's favorable situation as a distributing center is reflected in the stability of her coal trade.

The following values for power factors may be assumed for circuits and used in any calculations when exact values are not known:

Incandescent lighting and synchronous motors ..95 per cent.  
Lighting and induction motors .....85 per cent.  
Induction motors alone .....80 per cent.



## Coal in Canadian Middle West

The importance of the coal deposits of Saskatchewan, occurring as they do in a territory lacking almost entirely resources of timber or water power, has been to a great extent overlooked in the past, says Consul Samuel C. Reat, of Alberta, in *Commerce Reports*. Of late years the investigations carried on by both the Department of Mines, Ottawa, and the Geological Survey of the United States, on the coals of the same character on the other side of the international boundary, have brought out facts which place these deposits on a much higher plane, and these investigations have paved the way toward obtaining more definite data which will develop uses for these low-grade lignites for purposes hitherto thought impossible.

The more important districts, or rather those districts which have been studied in any detail, are very few; but there is no doubt, as the demand for coal grows, other districts will be developed.

The only important district at present from the shipping standpoint is the Estevan district, while the Willow Bunch area has been tapped by a railway only lately. From estimates computed by the Geological Survey of Canada, it is found that the coal resources are enormous. The estimated tonnage in the Belly River formation is 33,908,000,000 tons. In the Tertiary formation in the Souris area, consisting of eight townships, there are 2,304,000,000 tons, while the area to the west of Souris has possibilities up to 23,600,000,000 tons.

The principal mines of the Estevan district are those of the Western Dominion Collieries Co., whose property is equipped for an output of 1000 tons per diem; those of the Manitoba & Saskatchewan Coal Co., equipped for an output of 2000 tons per diem; and those of the Eureka Coal & Brick Co., with an output of 200 tons per day. There are some 15 to 18 other smaller mines, supplying mostly local markets and working intermittently.

According to a report just issued by the Dominion Government the 3,821,739 short tons of coal produced in Alberta for 1914 was 11.25 per cent. less than in 1913. The export of coal from Alberta to the United States last year was 106,087 tons, according to the official report. The declared export returns from this consular district show only 7774 tons.

There are 246 coal-producing mines in the Province of Alberta, of which 62 were new mines opened up last year. The cost in lives of this 3,821,739 tons of coal last year was 209 victims of fatal accidents, of whom 189 were killed in the Hillcrest mine alone and 1 man on the surface, making the mining accidents, aside from the Hillcrest, only 20 for the whole province.

## North Dakota's New Coal Laws

BY A. L. H. STREET\*

Coal was the subject of two laws adopted by the North Dakota Legislature, which adjourned Mar. 5, 1915.

One of these laws describes the word "coal" as including "all kinds of coal, and . . . what is known as lignite coal." The other law relates to the use of lignite coal in state and county institutions and schools. Summarized, the provisions of this act are as follows:

The various state institutions, county buildings and public school houses of the state must "use for fuel native

or lignite coal or lignite-coal products, and it shall be unlawful for any officer to purchase for use in such institutions . . . any coal other than that taken from the mines within the boundaries of this state," except when the cost of other fuel does not exceed that of native coal, and excepting public schools located six miles or more from a mine or railroad station.

The purchases of lignite coal must be based upon proposals invited by notice in a newspaper published and having a general circulation in North Dakota and must be awarded to the lowest responsible bidder. Copies of such proposals must be filed with the Secretary of State. Proposals are to be based upon the standard of 2000 lb. per ton.

The law reads as follows:

Standard contract grade of lignite coal shall contain as delivered 33 per cent. of moisture as determined at 105 deg. C. For actual weight of moisture above 33 per cent. deduct proportionately the price per ton. Standard contract-grade lignite coal, water-free basis, shall contain from 10 to 15 per cent. of ash. For each 1 per cent. of ash above 15 per cent. deduct 2½ per cent. of the bid price per ton. For each 1 per cent. below the 10 per cent. add 1½ per cent. of the bid price per ton. Standard contract-grade lignite coal shall contain, water-free basis, not over 2 per cent. of sulphur. For each 1 per cent. or major fraction thereof above 2 per cent. deduct 2 per cent. of the bid price per ton. Standard contract-grade lignite coal shall contain, water-free basis, 9500 B.t.u., and the price per ton shall be based upon that number of heat units. When the B.t.u. are in excess of that amount, such excess shall be paid for proportionately; and, if the contents are less than 9500 B.t.u., then a proportionate amount shall be deducted from the price. The method of ascertaining the above facts shall be agreed upon between buyer and seller; provided, that any school or institution which does not use to exceed 50 tons of coal in any one year shall not be required to publish for proposals.

Any board that violates the provisions of the act renders its members personally liable for the purchase price of the coal and exempts the institution from liability; "provided, however, that this act shall not apply to country schools or public buildings where no janitor is employed."

## A Government Coal Mine

BY A. P. CONNOR

This mine, which was shown on the front cover of COAL AGE last week, is owned and operated by the Federal Government. The coal is a lignite variety and is deposited in a flat bed. The mine consists of a series of drifts in a 9-ft. seam, while the workings extend to an average depth of 100 ft. below the surface of the ground.

The main entry in the mine is about 2000 ft. long and 6 ft. in height and width. The rooms where the workings have progressed are about 150 ft. long and 16 ft. wide. The mine is ventilated by motor-driven fans. The workings are wet, the water being collected in sumps and taken out in barrels. The average output of the mine is 100 tons a day. The cost of mining the coal, including maintenance costs, has been found to be \$1.78 a ton. The miners are provided with comfortable quarters free, and their wages average from \$3.50 to \$5 a day.

The mine is situated at Williston, N. D., on the governmental reclamation project there.

**Claims to Ownership of Coal**—When underlying coal is owned by a person other than the owner of the surface of land, any title acquired to the surface through adverse possession cannot be deemed to affect the title to the coal. (United States Circuit Court of Appeals, Fourth Circuit; *Shrewsbury vs. Pocahontas Coal & Coke Co.*; 219 Federal Reporter 142.)

\*Attorney-at-law, St. Paul, Minn.

## The Labor Situation

**SYNOPSIS**—The Coshocton miners of Ohio approve by referendum vote an agreement with the operators. The rate for run-of-mine coal machine-mined is 51c. for wide work and 60c. for narrow work. A reduction in wages is demanded at a small mine in Pennsylvania, and the duration of a shutdown is extended at Vesta No. 5. Floyd County, Kentucky, is organized.

The joint committee representing the miners and operators in the Coshocton district, which met at Coshocton, Ohio, last week, agreed on a wage scale. This was submitted to the referendum vote of the miners' organization on Apr. 10 and was carried almost unanimously. In all, about 1200 miners in the district are affected, and they have been idle since Apr. 1, 1914.

The scale as formulated by the joint committee provides for 67.6c. for pick-mining on a mine-run basis. In machine-mining in wide places 11c. will be paid for cutting and 40c. for loading, or a total of 51c. In mining by machine in narrow work 13c. will be paid for cutting and 47c. for loading, making 60c. Inside workers are to be paid at the rate of \$2.84 per day and outside labor at the same rate as provided in the former scale. C. L. Barnes was chairman of the conference, and the secretaries were E. P. Miller and C. R. Thrapp.

### Eastern Ohio Still on Strike

In the eastern Ohio district there were no developments during the past week. Everyone appears to be awaiting the action of the legislature on the Gallagher amendment to the mine-run bill. It is announced that it has been placed on the house calendar for action Apr. 12. Eastern Ohio operators in general believe it will be adopted.

The officials at the miners' headquarters at Bellaire have issued a statement saying that the miners will not sign except on the mine-run basis, no matter what the legislature does with the Gallagher bill.

### A Mine Lowers Wages in Somerset County, Pennsylvania

A correspondent at Garrett, Penn., writes that the Atlantic Coal Co. has demanded a reduction of 10% on all day labor and 5c. on each ton of coal, the schedule applying to No. 2

plant. It was also declared that nothing would hereafter be paid for setting timbers. This resulted in a strike of about 200 miners. The Atlantic Coal Co. operates near Meyersdale, Penn., in the Somerset County district.

It is much to be regretted that some operators think they are justified in reducing wages so as to take contracts away from other companies which are still paying the scale customary before the depression. All attempts to secure such advantages over their competitors injure the employees of the other companies and should be resisted by the men working for any management seeking such a reduction. Everyone knows that no company would be disposed to reduce wages if it thought it would have to meet the competition resulting from equal reductions made by its rivals. The whole reasonableness of a cut in the wage-rate lies in the advantage it gives to one employer to undersell a competitor who pays a better wage. He is not out to create trade, but to secure it at the expense of another man who is more liberal to his men and who hesitates to add to their misfortunes by giving them at once both short pay and short time.

Vesta No. 5 mine, owned by the Jones & Laughlin Steel Co., of Pittsburgh, reopened Apr. 8 after a long period of idleness. It is said that the miners refused to return to work unless 18 men formerly employed by the company were reinstated. The company did not argue the matter, but closed down the mine.

### The Union in Kentucky and West Virginia

In Floyd County, Kentucky, two organizers of the United Mine Workers of America have managed to form a strong branch of the organization, apparently with the approval of both miners, operators, business men and county officials. The meetings were held in the courthouse. Two hundred charter members were admitted.

The returns on the referendum in the New River and Winding Gulf coal field are now officially reported. The agreement recently made has been ratified by a majority of 156½ votes. Several local unions lost their votes because their returns were made under seal. These were Fayette, McAlpin, Tams, Glen White and Slab Fork. Eccles' returns arrived late. Had the votes of these locals been counted their vote would have stood 1007 for ratification as against 542½ for rejection; so the action of these unions would have been to swell the small majority in the other parts of the field. Of the 40 unions voting, 23 were for ratification and 17 for rejection. Of those favoring ratification, 12 voted unanimously. On the other side 11 were equally clear as to the right course of action.

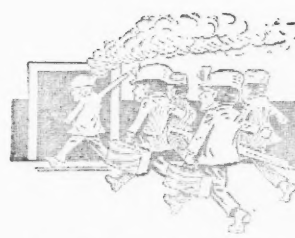


With Her Liniments and Patches

## The First-Aid Corps

By MICHAEL BERNARD

Written Expressly for COAL AGE



Always Swift and Always Ready

**W**HEN our youthful lives were pestered  
With the boil that ached and festered,  
And with gashes, bruises, scratches,  
Blisters, burns and stings galore,  
Mother soothed our wounded feelings  
And accomplished wondrous healings  
With her liniments and patches,  
Like a first-aid corps.

**S**HE performed the dual mission  
Of the surgeon and physician  
Till we felt that she could handle  
Any kind of cut or sore;  
But, arrived at man's discretion,  
We are forced to make confession  
That she couldn't hold a candle  
To the first-aid corps.

**A**LWAYS swift and always ready,  
Calm, self-confident and steady,  
Trained to shun the painful errors  
Made by rescuers before;  
Armed with bandage, gauze and lotion,  
Filled with courage and devotion,  
Grim disaster holds no terrors  
For the first-aid corps.

**A**CCIDENTS like laceration,  
Twisted limbs, asphyxiation,  
Severed artery and bleeding,  
And a half a hundred more,  
Fail in modern times to frighten,  
For the outlook's bound to brighten  
When proficient help comes speeding  
With the first-aid corps.

## Editorials

### Economic Utilization of Coal

The American coal operator of today is a thorough economist. There was a time perhaps when guesswork and the rule-of-thumb answered the purpose of carrying on his business. Fortunately that time is past, and the modern operator must know the facts and takes nothing for granted.

We have heard much in the recent past concerning the exhaustion of our coal measures, and "conservation of natural resources" has become a household word. Some people hold the view that we of the present generation are morally accountable to those that are to come after us for our profligate waste of the riches with which nature has endowed the world.

However ethical such a doctrine may appear and however high a literary polish may be given to the phraseology in which it is couched thinking people are of the belief that the present is ours to enjoy and that we should make such use of nature and her gifts as best to serve the present needs of humanity. Let the future take care of itself. Coming generations will have their problems as we have ours and will doubtless be able to solve them by ways and means quite as efficient as those which we employ.

We have long been accustomed to regard coal as a substance containing a certain number of British thermal units per pound, this heat being made available through chemical combination with a certain quality of atmospheric air. Coal has been and is now being purchased regularly on the basis of its heat content. A contract for fuel has been a balance between British thermal units upon one hand and dollars and cents upon the other. A ton of coal has meant so much heat and nothing else. It has been, and in large measure is still in the popular conception, a fuel and a fuel only—a storehouse of heat-energy which warms our homes, cooks our food, lights our buildings, hauls our trains, smelts our ores and drives our commerce to the four corners of the globe.

Within the comparatively recent past, however, man has learned that coal contains more than British thermal units; that a multiplicity of products useful in the arts and sciences may be recovered from the gases evolved in the process of coking. Furthermore, the heat, the principal constituent for which the coal is dug, remains practically undiminished.

Besides the coke and gas which may be employed advantageously for metallurgical purposes or for the generation of power, the tar, ammonia, benzol, etc., recovered in the process of coking frequently possess a market value almost, if not quite, equal to the original coal as it was delivered to the byproduct ovens.

In our present stage of development along economic lines, no one would venture the assertion that the utmost attainable has been reached. Development of the coal industry will proceed in the future as it has in the past, whenever and wherever such development and improvement will pay a reasonable dividend upon the capital necessarily invested.

The invested capital of production is increasing, but not so rapidly as is the cost of coal. Consequently the time may not be far distant when we may reasonably anticipate that, notwithstanding the high fixed charges of the by-product coking plant, we will no more consider burning raw coal for the sake only of the heat which is thus liberated than today we habitually eat wheat in preference to bread.

But this improvement in the utilization of coal will not come about as a measure of conservation. It will transpire rather from natural economic causes, such as the increasing cost of coal production and transportation. The products evolved will be many and varied, but their market value will be such that when the cost of the raw coal is properly proportioned, heat (or the primary product for which the coal is mined) will be little if any more expensive than it is at the present day.

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### The Have-Nots in California

California in 1913 had 35 coal miners and two operating coal mines, and it produced 24,839 tons of coal. It also at one time had a Special Commissioner of Mine Accidents who, once appointed, promptly muckraked the coal operators in other states than his own, not being able to find any at home, and made statements from which a competent technical mining man would have refrained largely because they were not true.

But California, being a revolutionary state, has not been satisfied with these services to the industry, but has recently memorialized Congress to inaugurate Government ownership of coal mines, the Assembly of the state showing a marvelous unanimity and voting for the resolution 49 to 5. Assemblyman Downing, a socialist of Los Angeles, introduced the bill.

The Sacramento, Calif., journalist who recorded the fact declares that the California legislature never did this before. It is its first offense apparently; let us hope it will be its last. The reporter declares that "the project calls for the supplying of citizens with coal at the cost-of-production price."

Herein is the goal of much of the present-day socialism—the abolition of profit. When, however, the government absorbs all the businesses of the world and runs them all without profit, when also all the sources of taxation are cut off because private ownership is at an end, shall we not long for some profits to build our plants, excavate our railroads and common roads and meet the constant needs for expansion? Everywhere we go we see evidences of profit—factories, bridges, docks, dwellings, tipples, power-houses and what not. Only where Indians and savages live are none to be found.

To seek an end of profits is nihilism and not socialism. We fear that the mild climate of the state has unbraced the Californians and made many of them disposed to policies which can end only in the death of civilization. And like the man who was asked where he preferred to have a carbuncle they declare they like best to have it on



the other fellow. They would like to see the regulation of industry tried on the sister states.

A coal miners' organ quotes a diatribe by Scott Nearing, an instructor in political economy at the University of Pennsylvania and at Swarthmore College, Pennsylvania. In it he says:

Is not the world beginning to realize that today the most sinister crimes against the ideals of Christ's religion are committed by the system of industry for profit?

If he will change *realize* to *imagine* we will agree with him. The world is truly beginning to believe that profits need an apology. But when we note that almost every improvement is derived from capital which is created by profit, then that profit becomes to us as dear as our homes, as indispensable as our means of employment. We know, when we reflect, that almost all construction is from the profits of some business somewhere if not of the business where the improvements are made.

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### Increasing Connellsville Coke Production

Iron and to a lesser extent metallurgical fuel are regarded as trade barometers. It is a well-recognized fact that when the steel mills of the land are busy other industries follow suit, and no man needs to go hungry if he is willing and able to work.

Metallurgical fuel such as coke is produced only about as fast as it is needed, and consequently its rate of production is an index to industrial conditions scarcely less sensitive and reliable than the manufacture of steel and iron.

During the past three months, or since the beginning of the present year, the production of coke in the Connellsville region has been steadily increasing. The first week in January saw about 200,000 tons of this fuel produced in that locality. At the present time the production is slightly over 280,000 tons weekly.

While many mines in the coke region have worked steadily for many months past, the majority have been on part time or closed down altogether. Many are now, however, either resuming operations after a shutdown or are increasing their capacity.

The reports from southwestern Pennsylvania have in the past few weeks been particularly encouraging. One hundred ovens have been blown in at Allison No. 2. The Ellsworth Colliery Co.'s works at Cokeburg and Ellsworth have been placed in full operation. The Marianna mine of the Pittsburgh-Buffalo Co. is working with 500 men. One hundred ovens were recently fired at Alicia, making 400 at that place. Reliance is operating 235 ovens six days per week; 35 additional ovens have been fired at the Century plant; 120 ovens were recently fired at Thompson No. 1 plant, making 400 in all, or the entire oven installation. Furthermore it appears to be the consensus of opinion that other plants will be starting within the next few weeks.

Whatever may have received the bulk of the blame for the present business depression, it would appear that one real cause of lessened prosperity lay in a lack of confidence. It would further appear that this lack of confidence is now vanishing and that better times are in store. While the wheels of industry are not turning as rapidly as they have sometimes done, their rapidity of rotation is at present increasing, slowly perhaps, but nevertheless steadily and surely.

### State Mine Reports

Owing to the frequent changes in mine-inspection officials, the state mine reports are often less valuable and less readily usable than they should be. In the short tenure of office, the incumbents do not have time to observe, consider and correct the shortcomings of their reports. Some are, however, most complete, notably those of Pennsylvania, Illinois and West Virginia.

Every report should contain a preface stating the period which the report covers, the number of pounds in a ton, the inclusion or exclusion of mine managers, superintendents, clerks, safety bosses and firebosses in the enumeration of employees, the statement whether washery tonnages have reference to coal washed from culm banks only or to all coal received by such washeries, a declaration that coke-oven employees and strippers are or are not included in the enumeration of outside men and a statement showing which coal mines are recorded and which excluded and whether the coal output is supplemented by a clay or other noncarboniferous product at any of the mines the output of which is recorded. In this way false inferences will be avoided.

Then also all instructions given to those who fill the forms should be repeated here in full. The rules guiding the tabulating clerks should also be given. It is important to know, for instance, if the "number of days worked" is calculated as an average of the collieries taken as units or whether it is a weighted average and whether the weight is made dependent on tonnage produced or employees engaged.

Thus one tabulator might add the days worked at some 100 collieries and divide by 100. Another would multiply the tonnage produced by the days worked and finally add these products, dividing the sum by the total output. Another would take the products of days worked and men employed at each colliery, add these together and divide the result by the total number of employees. The last method is preferable to all others.

A list of the mine inspectors, the numbers and the geographic bounds of their districts would also be extremely valuable. Most of the reports omit one or more of the statements mentioned, and reference to the contents is thereby made difficult. One report on its cover even failed to record the name of the state to which the report referred.

It would be well if the nature of inquiries could be standardized in the various states so that results might be made more precisely comparable. Matters of this kind are well worthy of the attention of the Mine Inspectors' Institute of the United States of America.

### A Profitable Season for the Retailer

The winter just closed has been a most satisfactory one to the retail dealers from the standpoint of profits, although the tonnage handled has been smaller. This is due to the fact that what coal has been shipped to the yards has been furnished at a minimum cost, including handling and hauling. Labor has been plentiful at less cost than in many seasons past, and the retailer has undoubtedly benefited on this score. The open winter has also permitted quick deliveries at a low cost, and the retailer has been able to buy his coal at the lowest prices in several years.

## Discussion By Readers

### Recognition of Bravery

*Letter No. 11*—I want to add a few words to what has already been said in regard to the recognition of acts of heroism in rescue work. I want to say, in the start, that I thoroughly believe that such acts of heroism and self-sacrifice in the mine warrant the same recognition as similar acts of bravery on the battlefield.

We read in our daily newspapers of the unselfish sacrifice of many lives in the European War. Men give their lives for the sole purpose of perpetuating the honor of their country and flag. These deeds are being enacted on the land, in the air, on the sea and beneath the waves. In many cases the actors face inevitable death. The same is true of the miner, with the difference that his acts are performed in the dark recesses of the mine away from public view. But the field of battle furnishes no greater danger than the mines, where rescue work often means "a race with death."

I am proud to say that in time of accident there are always men in large numbers willing, ready and anxious to go to the rescue of their fellows in danger. There is no spectacular display in this service, but trained men equipped with up-to-date rescue apparatus and devices for resuscitating those overcome with gas enter the mine heedless of their own danger. Anything else would be cowardly and unworthy of a true miner.

Every precaution is taken in the training of men for rescue work. The apparatus is constantly inspected and kept in perfect working order ready for any emergency. The captain of the rescue team examines the apparatus twice a week. In addition to these precautions, in the event of an explosion, the rescuers wearing the apparatus, before entering the mine, examine carefully every part to see that the valves are in working order and the tanks fully charged with oxygen and that all unions and joints are gas-tight.

It is needless to say that these men recognize the dangers they are about to encounter. By all means their heroic work should receive recognition.

J. W. POWELL.

Windham, Mont.

### Mining Laws and Legislation

*Letter No. 1*—Referring to Mr. Hogarth's letter, COAL AGE, Apr. 3, p. 613, regarding mining laws, etc., I wish to take issue with him in what he says about the need of the mine superintendent having a certificate, for two reasons.

The first reason is that the same line of argument could be extended to include the general superintendent, general manager and president, which would be impracticable. The same line of argument might be used also to show that because the superintendent, general superintendent or general manager is in authority over the mining engineer, master mechanic or electrician, he must in himself be all of these things.

The second reason is that one certificated official in charge of one job would seem to be enough; and the foreman, being in direct and immediate charge of the inside of the mine, should be that one. Also, it frequently happens that the superintendent is chosen as much for his executive ability as for his mining knowledge, and if he has sufficient executive ability to be a superintendent he will not insist on his foreman committing any act that would endanger the men under him; or doing so, he should be amenable to the law. The law must place the responsibility for the safe operation of a mine on some one person, and why not on the foreman?

If Mr. Hogarth's line of reasoning were followed to its logical conclusion the responsibility could not be placed on the superintendent on the ground that he must act in accordance with orders from his general manager; nor on the general manager, who must act in accordance with the orders of his president, and he in turn is controlled by his board of directors.

I do, however, agree with Mr. Hogarth in what he says about graded certificates for gaseous and nongaseous mines and with his suggestion that there should be more frequent inspection of the working faces with reference to roof and timbering conditions. I will even go further than Mr. Hogarth and suggest that in every mine the foreman should have sufficient competent assistants so that each working place shall be visited at least twice each working day by a competent person who shall have sufficient authority to see that the workmen properly protect and care for themselves.

EDWARD H. COXE.

Knoxville, Tenn.

### The Layland Mine Explosion

*Letter No. 1*—In the issue of COAL AGE, Mar. 27, p. 549, there appeared a criticism of the part taken by the federal Bureau of Mines in the rescue work at Layland, W. Va., following the explosion, Mar. 2, in the mine of the New River & Pocahontas Consolidated Coal Co.

Since the organization of the Bureau of Mines it or some of its officials have been the object of attack from men of the mining fraternity who should know better. Instead of handing out body-blows to the department at every opportunity afforded, these men should be their best friends and ardent supporters of the work the bureau was organized to perform. This would go far toward an early realization of the desired results; namely, to develop the most efficient rescue organization and, at the same time, carry on effective research work for the benefit of the men employed in the mine.

In regard to the criticism made in the COAL AGE editorial referred to above, I want to suggest that if the federal rescue corps is open to criticism in this instance, the state inspection department is also worthy of the same charge. My purpose in writing at the present time is to point out the mistake of making a hasty criticism, which could be avoided by more mature thought.

All practical mining men know that the work of rescue in mines is often carried on under difficulties that render progress slow indeed. Such was the case in the Layland mine, where the haulage road was badly blocked by the debris resulting from the explosion; and the work of rescue, for that reason, had to be started and carried on through the air-course, until later when the clearing away of the wreckage made it possible to reverse the air current in the mine and enter by way of the main-haulage road.

As explained in *COAL AGE*, Mar. 20, p. 509, the stoppage of the fan for the purpose of making this change in the circulation produced a decided change within the mine, which was shortly after noticed by the five men entombed behind an improvised stopping in the ninth-left entry. It did not take long for these five men, who had been well provided with food and water in their prison, to make their escape along the main-haulage road, under the changed conditions.

It is not claimed that either these five men or the remaining 42 men, for that matter, entombed behind two improvised stoppings in the tenth-left entry were rescued by the men who had labored so hard for nearly three days to accomplish this end. The rescue, if such it may be called, was the result of their own initiative; and yet the inference to be drawn from the criticism to which I have referred is that if the air was good enough for these men to walk out of the mine without the aid of helmets, it surely would have permitted rescuers to pursue their work of investigating those portions of the mine not yet reached. If this inference is merited, every man on the rescue corps should be awarded a leather medal.

It is not clear why the men on the staff of the bureau are subjected so often to special criticism, while the state mine inspector, who is naturally better acquainted with the local conditions and who is generally better paid for his service than men of the bureau corps, escapes such criticism. It should be recognized that more harm than good results from so doing. Messrs. Holmes, Rice and Paul, at the head of the rescue work of the bureau, have several times pointed out that the work of rescuing entombed men and the stoppage of mine fires is not regarded by them as a "secondary affair," as some miners and mine officials have assumed. It is this false idea of the bureau's work and aims that has led at times to unjust condemnation, because these men, trained to scientific work and methods, have refused to sacrifice their lives in what would prove, on more mature thought and the exercise of calm judgment, a futile effort. The fact is that, with all this caution on the part of a trained rescue corps, a greater percentage of the men engaged in this work have lost their lives than can be shown by the statistics of any other industry. This fact alone should answer any accusation of cowardice or indifference.

#### FAIR PLAY.

Wheeling, W. Va.

*Letter No. 2*—I have been much interested in reading the account of the Layland mine explosion, *COAL AGE*, Mar. 20, p. 508, which seems, however, to give undue credit to the rescue men of the state and federal departments. The account shows that 54 men in all escaped from the mine. Of these, seven owe their lives to the work of the

hastily organized local rescuers, under the lead of General Manager Bertolet. My purpose in writing is not to cast any reflection on the heroic work of any class of mine rescuers, who certainly earn the right to all the credit due them. I only desire to rehearse a few facts of which I have personal knowledge, having engaged for a considerable time in the work of rescue at this mine.

The explosion occurred Tuesday morning, Mar. 2, shortly after the miners had started work at the face. The damage caused by the explosion has been previously described, but the general plan of the mine may not be thoroughly understood. The Layland mine or mines consists, practically, of a pair of main tunnels, running along the face of the mountain, a few hundred feet under cover. Cross-tunnels are driven into the hill off this main tunnel, and these cross-tunnels or entries form practically separate mines known as "No. 3 mine," "No. 4 mine," etc. There were 13 butt-entries turned to the left off the haulage road of No. 3 mine. The distance on the main tunnel, from No. 3 mine to No. 4 mine, is 2400 to 2600 ft. There were nine butt-entries driven to the left off the haulage road of No. 4 mine. No. 6 left entry, in No. 3 mine, is cut through to the No. 4 mine air-course. The main tunnel extends a few thousand feet beyond the mouth of No. 4 mine, and butt-entries are turned off this main tunnel, in by of that point. The face of the main tunnel is considerably higher in elevation than the face of No. 3 mine.

It was but a short time after the explosion occurred that the seven men referred to in the article in *COAL AGE* walked out of the mine. These men had worked in No. 4 left entry, in No. 3 mine.

The fan had been disabled and put out of commission by the force of the explosion, but repairs were quickly made and the fan started again. The first efforts of the local rescuers were to establish a current of air in No. 3 mine, as they were of the opinion that more men were still alive in that time. They soon had the air conducted along No. 3 air-course to the sixth-left entry, which was cut through to No. 4 mine, as previously stated. The mouth of the sixth-left entry, in No. 3 mine, was 1200 to 1500 ft. from where the men were entombed, as was developed later. Up to this time the local rescue party had been led by a superintendent of the New River & Pocahontas Consolidated Coal Co.

It was about this time that the state officials arrived on the scene. Following a short conference, it was decided to abandon the idea of further exploring No. 3 mine at that time, and the men were withdrawn and started to explore the workings of No. 4 mine, advancing as rapidly as possible along the left air-course of the main tunnel. This work had the effect to reverse the air in No. 3 mine, which was soon filled with the return air from No. 4 mine, the intake to No. 4 being now conducted through the main-tunnel air-course to those workings.

This condition of the circulation in the mine continued from Tuesday night until Friday night, when the fan was stopped, as has been stated, for the purpose of reversing the air current in the mine, in order to make it possible to explore further the workings in No. 3 mine. The fan was stopped from about 12:30 Friday night until about noon Saturday, by which time all the entombed men were out of the mine.



As has been stated, about 8:15 Saturday morning, while the fan was stopped, to the surprise of everyone five miners walked out of No. 3 mine with their lighted carbide lamps on their heads. They stated that they had come from the ninth-left entry in No. 3 mine, in which entry they had barricaded themselves shortly after the explosion occurred. They stated, further, that 42 men were still in the tenth-left entry in the same mine, where they had gone immediately after the explosion to barricade themselves in a similar manner.

It is true that rescuers at once proceeded into the mine to find the 42 men reported to be in the tenth-left entry. They found these men and assisted them out. The fact remains, however, that the men could have come out themselves, in the same manner as the five men who preceded them from the ninth-left entry. They would have done this probably in another hour had not the rescuers appeared in the meantime. The escape of these men from their entombment should therefore not be credited to the rescue work, but rather to their own cool judgment and self-possession in barricading themselves in these entries and not attempting to escape from the mine immediately after the explosion occurred, in which attempt they would undoubtedly have perished.

It is fortunate, indeed, that the Layland mine was not a gaseous one, or there would have occurred a second explosion when the entombed men came out with their open lights. This would have proved a serious matter as there were then from 50 to 75 rescuers in the mine. Having recited these facts of my own observation I am willing to allow all readers to judge for themselves where credit belongs.

#### ONE OF THE RESCUERS.

—, W. Va.

### When Should Rescue Work Be Abandoned?

*Letter No. 1*—The editorial that appeared some time since in COAL AGE, Jan. 9, p. 90, entitled "When Should Rescue Work Be Abandoned?" attracted my attention. The question of rescue work has always appealed to me very strongly by reason of its seriousness and importance.

The question of how far rescuers are justified in risking their own lives in the attempt to save others will always meet with a variety of opinions among mining men. For myself, I want to say emphatically that I am of the opinion that rescue work should *never* be abandoned as long as there is the remotest chance to get into the mine and until the last man has been rescued or accounted for.

The history of coal mining is replete with instances where entombed miners have been rescued days after the occurrence of the explosion that made them prisoners in the mines. In a few instances these unfortunate men have found their way out through the Stygian darkness of the mine and have come unassisted to daylight, safety and home, after they had been given up as lost. Such instances will be repeated from time to time in the annals of coal mining yet to be written.

There is manifested, too often, the tendency of mining men when reviewing the results of rescue work following a great mine disaster to criticize the actions of those who had charge of the work. This criticism is offered

after the true conditions that existed at the time in the mine had become fully known. The story of rescue has been read, as it were from an open book, with all the knowledge that subsequent investigation has made available. The fact is ignored that the rescuers at the time knew nothing of the conditions prevailing in the workings, the location of the men whom they hoped to save or the possibilities of their own chances of success and safety. All of this information now clearly revealed had then to be judged by meager facts and experience, in the excitement of the moment when the fate of fellow-workers rested on instant and wise action.

In this connection I recall the words of Sir Thomas Holland, referring to the tragic death of W. H. Pickering, H. M., mine inspector, who sacrificed his life in the attempt to rescue any possible survivors of the first explosion in the Cadeby main colliery, of July 9, 1912. Mr. Holland remarked:

It is easy to be wise after the event; it is easy apparently in the comfort of an office chair to criticize the wisdom of more experienced men; but we often fail to distinguish between the conclusions which were justified by the facts before the rescuers at the time and those which are developed later.

Fancy Pickering sitting at the surface estimating the risks of another explosion while his fellows were dying below! Doubtless if the rescue party had been restrained long enough, in this case as in similar cases, they could have proved the futility of an attempt, as the men would then have been dead.

But the deeds of men like Pickering and Scott are worth more than lives; through their deaths the spirit of the race lives, for to this world a brave man dying in the face of danger is worth more than ten cowards living and carefully counting the costs.

The keynote of rescue work is a high degree of courage without recklessness. For this there should be selected men of strong physique, known courage and superior natural intelligence. Their motto should be, "Save the lives of others, if possible, even at the cost, perhaps, of our own."

In closing, I want to quote one verse from Berton Braley's poem entitled, "The Boys of the Rescue Crew," which appeared in COAL AGE, Vol. 4, p. 685. It reads as follows:

"By day or night  
It's theirs to fight  
With death itself in view,  
And they face their fate  
With hearts elate,  
The boys of the Rescue Crew!"

J. W. POWELL.

Windham, Mont.

### Longwall in the Pittsburgh Seam

*Letter No. 5*—There is only one way in which the No. 8 seam of coal in the eastern Ohio and the Panhandle district of West Virginia can be worked on the longwall system, and that is by the adoption of the *longwall-retreating* plan. If the capital invested will permit of driving the entries to the boundary lines of the property and longwall work be then started at that point, on the retreating system, I believe the work would undoubtedly prove successful.

It has long been the custom for Pennsylvania mining men who have migrated into these districts to hold up their hands in holy horror on being informed that from 45 to 50 per cent. of the coal must be left in the ground. When

these men start to operate the mines in these districts, they immediately begin to devise plans for extracting the pillar coal. In many cases, they start recovery work on a splendid scale. They procure a couple of dozen good pick-men and for a period of from two to six months the work of recovery booms.

At about this time, however, by an inexorable rule, it is found necessary to rush timber, cement and other material into the mine to build cribs to control the squeeze that has set in and threatens to close the mine. This condition may continue for a couple of months longer, when the company gives up the idea of being able to recover the pillar coal, and the man with the big idea of "pillar recovery" is forced to hunt another job—an older and a wiser man.

It is not strange that a mining man used to a fairly good recovery becomes heartbroken when he is obliged to leave these pillars and stumps required for the successful working of the No. 8 seam in these districts. But let them take the advice of one who has tried, and *let it alone*. In working this seam the fact has to be learned by hard experience that the soft shale underlying the hard limerock will not permit the "gradual settlement" that has been claimed by longwall advocates in this discussion.

As far as I have been able to learn, this limerock has not been broken in eastern Ohio or in the Panhandle dis-

trict of West Virginia. Another fact that must be learned in respect to the working of this seam is that the slate over the coal cannot be used to build the packwalls required in the longwall system. The nature of this slate is such that it air-slakes and crumbles to pieces in a few days, before it is possible to complete the brushing of the roof necessary to keep the roads open in longwall work.

Notwithstanding all these facts, I believe longwall *can* be introduced and successfully conducted, on the retreat-ing plan, in both of these districts; but the man who at-tempts to work the longwall system in any other way will lose out so quickly that he will not know how it hap-pened.

I would like to see a retreating plan of longwall sub-mitted, in the pages of COAL AGE, that would be adapted to the working of the No. 8 seam in eastern Ohio and the Panhandle district. I am convinced that if these discus-sions are continued practical results will follow, and a good plan will be developed that will avoid the deplorable loss of coal in the working of this seam. With the present plan of working this waste of coal is apparently unavoidable, but every effort should be made to stop such waste, by the adoption of a plan that will be feasible and practicable, in the operation of coal mines.

O. P. RATOR.

—, Ohio.

# Study Course in Coal Mining

By J. T. BEARD

## The Coal Age Pocket Book

### INFLAMMATION AND EXPLOSION OF GAS

**Theory of Inflammation.**—The inflammation of a combus-tible gas involves, at least, two main conditions that are essential to the reaction. They are as follows:

1. The presence of another gas that will **support the com-bustion** by reason of the different affinities of the elements of the gases that invite dissociation and recombination to form other compounds.

2. A **rise of temperature**, at the point of contact of the two gases, sufficient to start the reaction.

The ignition of a combustible gas in some cases (carbon monoxide) requires, besides the above, the presence of **water vapor**.

**Temperature of Ignition.**—At the same pressure and under the same conditions of ignition, the temperature at which a given gas inflames or the temperature of ignition for that gas is **fixed**. The following table gives the average temperatures of ignition, as determined by experiment:

AVERAGE TEMPERATURES OF IGNITION OF COMBUSTIBLE GASES IN NORMAL AIR

Gas	Symbol	Temperature of Ignition (Deg. F.)
Carbon monoxide.....	CO	1240
Methane .....	CH <sub>4</sub>	1212
Ethane .....	C <sub>2</sub> H <sub>6</sub>	1140
Ethene (olefiant gas).....	C <sub>2</sub> H <sub>4</sub>	1124
Hydrogen .....	H <sub>2</sub>	1077
Acetylene .....	C <sub>2</sub> H <sub>2</sub>	970

**The Nature of Flame.**—Flame, as here considered, is burn-ing gas. It may be **luminous** or **nonluminous**, according to the presence or absence of carbon either free or combined as hydrocarbons. The incandescence of the carbon particles when present renders the flame luminous. This is the case with most oil-fed flames and flames burning in a dusty atmosphere. The flame of hydrogen burning in clear, pure air is prac-tically nonluminous. Methane produces an almost nonlum-inous flame, but the flame of the heavy hydrocarbon gases is always more or less luminous.

**The Temperature of Flame.**—The temperature of flame is variable, owing to numerous conditions that affect the com-bustion of the gas both as to its **rapidity and completeness**. The temperature will vary in different parts of the same flame, because of a variable supply of air that not only affects the combustion of the gas but absorbs much of the heat de-veloped and lowers the temperature of the flame.

Owing to these varying conditions it is clearly impossi-ble to calculate the actual flame temperature of a burning gas. This is often roughly assumed to be about one-half of the **theoretical value** as calculated from the heat of com-bustion per pound of gas and the heat absorbed by the cor-responding products of combustion, for each degree rise in temperature.

It is important not to confuse the **flame temperature** of a combustible gas with its **temperature of ignition**, as they have no connection with each other.

## The Coal Age Pocket Book

**Influence of Temperature on Explosion.**—A rise of the initial temperature of an explosive mixture slightly extends the lower inflammable limit, but has no appreciable effect on the higher limit, owing to the small relative value of the increase as compared with the high temperature developed in the explosion.

**Influence of Pressure on Explosion.**—Pressure exerted on an explosive mixture increases its **power to absorb heat** and thus renders it more readily ignitable. In other words, an increase of pressure lowers the lower inflammable limit of an explosive gaseous mixture. An increase of pressure, by increasing the **velocity of propagation** of the explosion in the mixture, raises the temperature developed and extends the higher inflammable limit. In other words, an increase of pressure **widens the explosive range** of a combustible gas.

**Influence of Relative Humidity on Explosion.**—While the presence of moisture (water vapor) in a gaseous mixture is often necessary to secure its explosion, as explained in refer-ence to carbon monoxide, the water vapor absorbs much of the heat and lowers the temperature developed, thereby reducing the **rate of combination** and the **force of the ex-plosion**, except where fine coal dust is suspended in the air, when partial dissociation may take place in the water vapor and result in increasing the energy of the reaction.

**Influence of Catalysis to Cause Explosion.**—Catalysis is the effect produced by a foreign substance to assist chemical reaction between two other substances, while the substance itself undergoes no change—first discovered by Berzelius. Much difference of opinion exists as to the suggested **catalytic action** of fine incombustible dust suspended in mine air, to assist the explosion of combustible gases. Finely powdered **stone dust** has been shown to retard the ignition of coal dust by mixing with and diluting the latter. This effect, however, is wholly physical and not related to the possible catalytic action referred to by Sir Frederick Abel and others who have studied the subject closely.

**Influence of Character of Initial Impulse.**—The manner in which the gas is ignited or the character of the initial im-pulse determines largely the explosion of gaseous mixtures. For example, a firedamp mixture ignited by a **lamp flame** may not explode, while if fired by the flame of a **blowout** or **windy shot**, the greater volume and intensity of the flame may cause an explosion.

The **volume of the flame** is important, because it envelops a larger portion of the gaseous mixture and ignition is thus started generally throughout the mass, causing a greater development of heat and reducing the percentage of loss by radiation, convection and conduction.

The **intensity** of the initial impulse or the higher tem-perature of the igniting flame will often cause the explosion of a gaseous mixture that would burn quietly if ignited by a less intense source of heat energy. The dissipation of heat is so rapid and general in a burning gas that the transition from **inflammation** to **explosion** requires a conservation of heat or greater local energy than can often be realized in the large open workings of a well-ventilated mine.

## Inquiries of General Interest

### Shipment and Transportation of Coal

I would appreciate answers to the following questions:

1. Is it true that the loss of coal from steel coal cars while in motion and, particularly, by theft when the cars are standing on sidings at stations is sufficient to cause any material loss to shippers?

2. Are there standard specifications for use in constructing steel coal cars? If so, can you give me the dimensions required and the details of construction generally included in such specifications.

3. What is the clearance between the top of cars and coal chutes or loaders at the mine and at coal bergs? Can these chutes, as a general rule, be raised and lowered to accommodate cars of different types?

4. How is the coal distributed in the cars when loading; does the chute swing from end to end of the car so as to distribute the coal evenly, or is the coal distributed by manual labor?

5. Kindly mention a list of the principal coal companies shipping coal to market and give any data that may be available showing losses in transit between shippers and distributors of coal.

A. L. WYMAN.

Ridgefield Park, N. J.

Replying to these questions in the order in which they are given, it may be stated that—

1. The shrinkage of coal shipments, in transit, is the result of several causes that vary in different localities and under different conditions of preparation of the coal for shipment. These losses are no greater in the use of steel coal cars than where wooden flats are employed. The loss is very much decreased by the use of box cars, for the reason that there is less loss by the drying out of the coal in transit and by theft while standing on the siding, since these cars are closed and sealed before the shipment is made.

The shrinkage of the shipping weight is sometimes only *apparent*, due to imperfect weighing of the coal either at the point of shipment or at the destination. A *real* shrinkage may be due to the drying out of the coal, which is often shipped from the mine in a wet condition, or to actual loss by falling off the cars when the coal has been improperly loaded; or it may be occasioned by theft while the cars have been standing on the siding or, as sometimes happens, the coal is taken from the cars for use on engines when the regular supply runs short. The loss by theft is always greater in the cold seasons of the year. These losses are all variable and cannot be accurately estimated.

2. Different railroads have different standard requirements regulating the dimensions of cars for different shipping purposes. The details of construction are determined by contract of the manufacturing company with the engineering department of the road for which the cars are made, or by the specifications furnished by that

department to their own shops. An interesting table giving the limiting dimensions for different styles of cars and railroads was published in *COAL AGE*, Vol. 6, p. 462.

3. A clearance of 4 or 6 in. is generally allowed between the top of the coal as loaded on the car and the bottom of the loading chute. Some railroads have regulations specifying the height to which coal can be loaded above the top of railroad flats. In this connection, an interesting article, giving the instructions issued by the St. Louis & San Francisco R.R. to coal shippers on its lines, appeared in *COAL AGE*, Vol. 4, p. 747. The instructions provided, in that case, for a height of 26 in. from the top of steel cars to the top of coal. For wooden cars this height was reduced to 20 in.

In general, loading chutes are stationary and cannot be raised or lowered. In many cases, however, a movable apron is provided at the bottom of the chute that can be raised or lowered a few inches.

4. There are numerous appliances for distributing the coal evenly in the car when loading. The most of these are adapted to the loading of box cars, which present the difficulty that all the coal must be run into the car through the center door. Some of these loaders employ a chute that can be run into the car and turned so as to throw the coal into either end. In other forms of loaders, the platform on which the car stands when being loaded is tilted so as to throw the coal first to one end of the car and then to the other. For a more even loading of flat cars and to avoid the breaking of the coal, a special loading boom has been designed by the Roberts & Schaeffer Co. that can be raised and lowered as the coal is piled in the car. This loading boom has a shaking motion that assists the coal in sliding down the chute.

Loading chutes are not arranged to swing from one end of the car to the other when loading flat cars, but even distribution of the coal is effected by letting the car down on the track as the coal is loaded, the loading beginning at the lower end of the car. Manual labor is now only employed for distributing or "chunking" the coal when loading box cars and for trimming the top of coal flats ready for shipment.

5. Some of the largest shippers of coal, in different states, are as follows:

Tennessee Coal, Iron & R.R. Co., operating in Alabama and Tennessee; Colorado Fuel & Iron Co., operating in Colorado; New Staunton Coal Co.; the Superior Coal Co.; Bunsen Coal Co., operating in Illinois; Delaware, Lackawanna & Western R.R. Co., Lehigh Valley Coal Co., Lehigh & Wilkes-Barre Coal Co., Lehigh Coal & Navigation Co., Pennsylvania Coal Co., Delaware & Hudson Co., Susquehanna Coal Co., all operating in the Pennsylvania anthracite region; Pennsylvania Coal & Coke Corporation, Pittsburgh Coal Co., Consolidated Connellsville Coke Co., all operating in the Pennsylvania bituminous district; Consolidation Coal Co., Cabin Creek Consolidated Coal Co., Pocahontas Consolidated Collieries Co., all operating in West Virginia.

No tables are available showing the specific losses of coal in transit between shippers and distributors of coal. Information in this regard can be best obtained by applying directly to coal distributors.



## Examination Questions

### Alabama First-Class Mine Foremen's Examination, Held Jan. 25-28, 1915

(Selected Questions)

**Ques.**—Where shots are being fired in mines producing large volumes of explosive gas what precaution should be adopted in firing the same?

**Ans.**—Under these conditions, all shots should be fired by competent and authorized shotfirers after the men have withdrawn from the mine. A thorough and efficient system of inspection of all holes drilled in the coal should be employed. These holes should be charged and fired by the shotfirers, who should have authority to refuse to charge and fire any hole that in their judgment is unsafe. It would be an advantage to use only permissible powder. Each place should be examined for gas before a shot is fired therein. The firing should begin on the "end of the air" and proceed slowly against the current, time being given for the air to sweep away the gases and dust produced by the shooting.

**Ques.**—Specify the conditions that must be fulfilled in order to secure good ventilation in a mine employing a large number of men.

**Ans.**—The mine should be divided into separate ventilating districts and a limited number of men allowed to work in each district. The air should be regulated so as to proportion the amount to the requirement in each district. The air in each split should be conducted in such a manner as to sweep the entire working face before passing into the main-return airway. The ventilating power must be sufficient to supply the required quantity of air for the mine.

**Ques.**—What are the causes of falls of roof, and how would you make an inspection to determine the security of the roof in a coal mine?

**Ans.**—The immediate cause of a fall of roof is the removal of the coal from beneath without providing any adequate support by timbers or packwalls. The presence of slips or faults in the roof strata induces sudden and unexpected falls of the roof. Roof falls are often caused by gas pressure in the strata or by squeezes and movements in the roof following the extraction of the coal. Driving too wide openings or leaving insufficient pillars induces falls of roof. Much depends, however, on the nature of the roof strata and the method of working employed and amount of timber used.

The roof in a mine must be carefully inspected to detect any slips or fault-lines or a weak or jointed condition of the roof. It is usual also to sound the roof by tapping the slate or rock with the butt end of a pick handle or other implement. Experience is required to sound a roof in this manner and determine its security.

**Ques.**—What dangers arise from the use of electricity in mines, and what methods would you employ to prevent accidents therefrom?

**Ans.**—The chief dangers are the liability of shock to men and animals by coming in contact with live wires,

also the ignition of gaseous mixtures that may accumulate in the mine, or the ignition of combustible material by the sparking of wires, brushes and switches, or the blowing out of fuses, or the breaking of wire conductors.

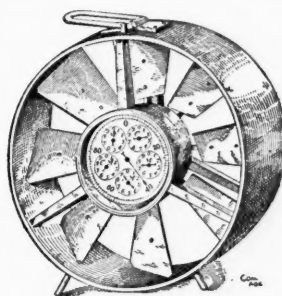
To prevent these accidents as far as possible, suitable danger signals should be displayed at all points in the mine where men are liable to receive a shock. All electric installations should be made by a competent electrician, and switchboards and other electric appliances should be carefully guarded. Live wires should be well insulated whenever possible. Men should not be permitted to travel on haulage roads where electric haulage is employed, and trolley wires should be suitably protected at all points where it is necessary for men or animals to cross such roads. The entire electric installation should be carefully inspected every day by a competent man.

**Ques.**—What percentage of relative humidity would you consider necessary in a dry and dusty mine?

**Ans.**—Inasmuch as the absorption of moisture by the air does not increase rapidly for a rise of relative humidity above 70 per cent. and since 60 per cent. presents a healthful condition of the atmosphere at ordinary temperatures, it would seem advisable to endeavor to maintain a relative humidity of the mine air, varying from 60 to, say, 75 per cent.

**Ques.**—Describe the anemometer and state its use in connection with mine ventilation.

**Ans.**—The form of anemometer generally employed in mining practice is that known as the "Biram anemometer." As shown in the accompanying figure, this



THE ANEMOMETER

consists of a metal ring within which is poised a rotating vane, the blades of which are inclined to the plane of rotation. The air current striking the inclined blades rotates the vane, the number of revolutions being recorded on the face of the dial by means of a series of gears. The instrument is so calibrated that each revolution of the vane corresponds to 1 lin.ft. of air

travel. This instrument is employed to measure the velocity of the air current in mine airways as expressed in feet per minute. It is important, however, to hold the instrument so that the vane revolves in a plane perpendicular to the direction of the current.

**Ques.**—Is it safe to pass a current of intake air through the abandoned portions of a mine and then conduct it to the face of the workings?

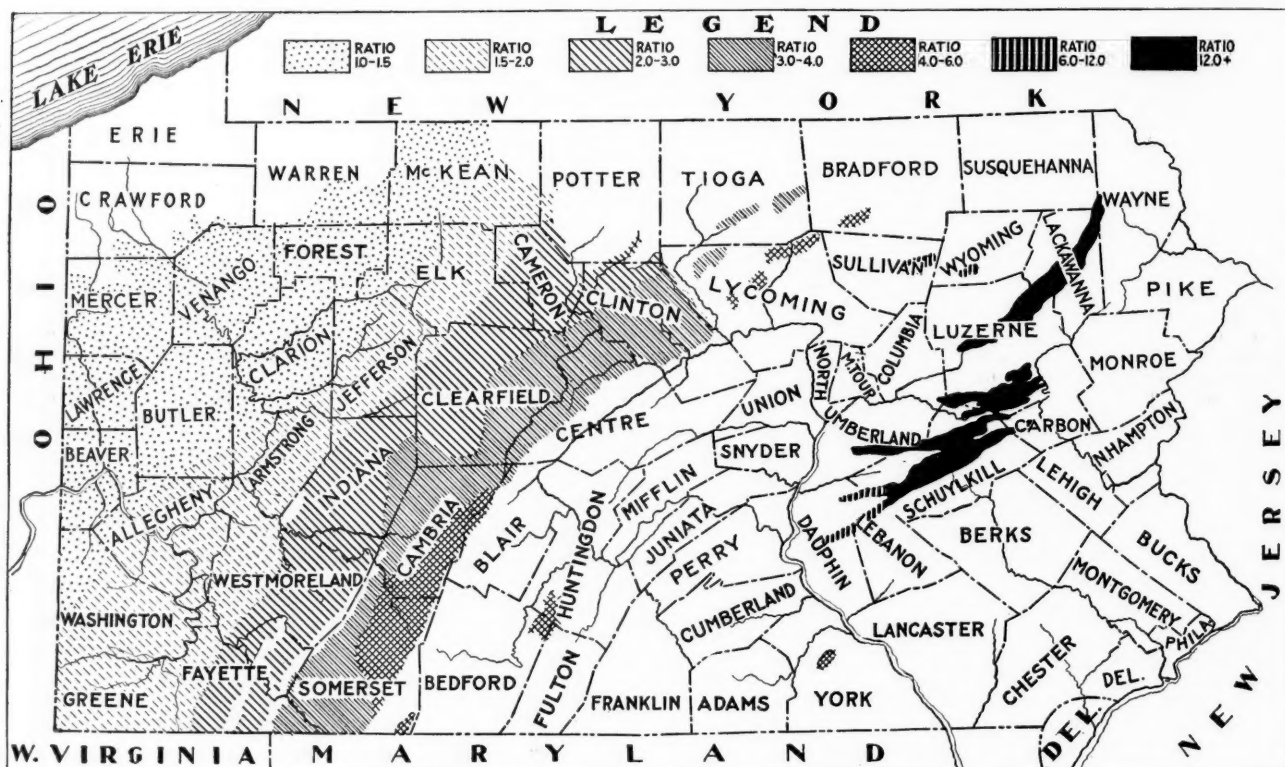
**Ans.**—No. The intake air should be conducted at once to the working face before being permitted to pass through abandoned workings. Otherwise the gases accumulated in the abandoned workings would be swept by the air current onto the men working at the face, and this would menace both the health of the men and the safety of the mine.

## Book Reviews

MINERALS OF PENNSYLVANIA, REPORT NO. 9, Topographic and Geologic Survey Commission of Pennsylvania, 1913. By Amos P. Brown and Frederick Ehrenfeld. Richard R. Hice, state geologist. 143 p. + 16 p. index. 6x9 in. 10 plates and 1 fig. Cloth boards. For public distribution.

An alphabetically arranged account of the minerals found in Pennsylvania, included somewhat broadly under this list being buhrstone, grindstone, millstones, allanite, amphibole,

It is a relation existing in the pure coal and has nothing to do with the impurities. The map illustrates in an excellent manner the editorial which appeared in our issue of Jan. 16 of this year entitled "Coal Beds and Their Characteristics." In this editorial we pointed out the fatuity of attempting to judge the character of a coal from its geological horizon. Its position geographically is equally important in many cases. For the readers' advantage we have calculated the following



MAP OF PENNSYLVANIA SHOWING HOW THE PERCENTAGE OF VOLATILE MATTER IN THE COAL VARIES WITH ITS LOCATION IN RELATION TO THE GREAT APPALACHIAN UPLIFT

pyroxene, asbestos, barite, beryl, brick, cement materials, chromite, clay, coal, copper, corundum, cyanite, epidote, feldspar, fluorite, garnet, natural gas, glass materials, glass-pot clay, gold, granite, graphite, greenockite, iron, lead and zinc ores, limestone, lime and cement rock, magnesium and manganese minerals, marble, marl, mica, mineral paints, molybdenum, tungsten, nickel, cobalt, petroleum, phosphate minerals, potash and saline minerals, salt, pyrite, marcasite, quartz, serpentine, shales, silica, silver, slate, strontium minerals, talc, titanium minerals, tourmaline, trap, uranium, radium minerals, and zircon.

We rejoice to see that the proof reading is much improved over that of last year's report. This year the volume is in this manner more worthy of the state which publishes it.

Coal receives 16 pages and 5 cuts, one of which we reproduce. On page 56 reference is made to the "Reynolds and Walton" coking coal. In case the people who live in that section fail to realize that they are listed as coke producers we will state that "Reynolds" should be "Reynoldsville" and "Walton" "Walston." The Pittsburgh district strange to say, does not get a number, though it is mentioned.

The descriptive matter is quite one-sided. Too much is taken from the reports of a few of the quadrangles, but otherwise the information is well chosen. A good cross section showing the order of the beds if not their thickness would have been helpful.

To enable readers to understand the map we republish, we will say that the fuel ratio is obtained by dividing the percentage of fixed carbon by the percentage of volatile hydrocarbons.

table showing the practical meaning of the fuel ratios to which reference is made in the map.

ANALYSES CORRESPONDING TO CERTAIN FUEL RATIOS			
Fuel Ratio	Ash and Moisture	Fixed Carbon	Volatile Matter
12.0	0.00	Pure Coal	92.31
12.0	6.00		86.77
12.0	8.00		84.92
12.0	10.00		83.08
6.0	0.00	Pure Coal	85.72
6.0	6.00		80.57
6.0	8.00		78.86
6.0	10.00		77.15
4.0	0.00	Pure Coal	80.00
4.0	6.00		75.20
4.0	8.00		73.60
4.0	10.00		72.00
3.0	0.00	Pure Coal	75.00
3.0	6.00		70.50
3.0	8.00		69.00
3.0	10.00		67.50
2.0	0.00	Pure Coal	66.67
2.0	6.00		62.67
2.0	8.00		61.33
2.0	10.00		60.00
1.5	0.00	Pure Coal	60.00
1.5	6.00		56.40
1.5	8.00		55.20
1.5	10.00		54.00
1.0	0.00	Pure Coal	50.00
1.0	6.00		47.00
1.0	8.00		46.00
1.0	10.00		45.00

Thus a coal having impurities of ash and moisture of 10 per cent. and a fuel ratio of 1.5 would have a fixed carbon percentage of 54 and a volatile matter percentage of 36.



## Coal and Coke News

### Washington, D. C.

President Wilson has acted upon Secretary Lane's recommendations relative to the choice of a route for the new Alaskan line, and in so doing he has brought the Alaska coal controversy of such long previous standing considerably nearer to a definite status. The order relating to the line and its route was signed on Saturday, Apr. 12, and designates the Alaska Northern R.R. as the first link in the Government line, the existing road to be bought by the Government and then extended up the Susitna Valley to Fairbanks, a total of 471 miles from Tidewater at Resurrection Bay. There will be according to the present plan a branch 38 miles long into the Matanuska coal field.

The latter field is to be opened and exploited, it being understood that the navy coal tests resulted in favor of the coals of the Matanuska field. Believing, however, that the coal of the Bering River field is also good, further tests have been ordered and will be made with a view to constructing a line to open up these deposits as well as the others.

Many coal claims have been filed in both fields and an effort is being made to dispose of these claims as fast as possible and close them up by passing upon their validity. The decisions that are being handed down will probably clear up the titles to the coal that have been in doubt since the days of the Ballinger controversy and by the time the branch line is open it will be possible to make new entries in accordance with law. The Government expects to reserve for its own use 5000 acres of the best coal land, thereby providing a supply for the navy. Many expect that within a year or two, it will also be possible to supply Pacific Coast ports with Alaska coal in commercial quantities.

The Alaska Northern is to cost the Government \$1,150,000, and the construction of the new mileage is to be made in sections by contract. The work will be in charge of the Alaska Engineering Commission which will have charge of the letting of the contracts and the conditions of work generally. It is believed that the region to be opened will be available for settlement and agriculture as well as for mining.

### A Supreme Court Decision

The Supreme Court of the United States has made public the complete text of the opinion lately handed down in the case of the Pennsylvania R.R. Co. vs. the Puritan Coal Mining Co. As has already been announced, the decision of the upper court is in support of the decision of the Supreme Court of Pennsylvania which held that the plaintiff in the lower court (the coal company) was entitled to recover damages due to unfair distribution of coal cars by the road. The decision as now published, however, throws new light on the outcome and offers some important points not previously given much attention.

The main facts in the case were shown to be as follows:

Usually the carrier was able to furnish shippers with cars on demand; but in 1902 there was a strike in the anthracite region which cut off the usual supply of anthracite coal to Eastern cities and compelled them to use bituminous coal mined along the lines of the Pennsylvania Ry. The new demand for soft coal was so great that the railroad company was not able to supply the full number of cars called for by the mining companies on its line. Its established rule in such cases was that cars should be allotted to the several coal districts in proportion to their output, the cars thus allotted to the districts being then distributed to the mining companies there in proportion to their capacity. During the anthracite coal strike, however, the carrier violated this rule and made excessive allotments to the "scalp level region," in which the Berwind mines were located, and made too small an allotment to the "mountain region" in which the Puritan mines were situated.

There was evidence that the Puritan company had orders for coal at a price which would have netted it a large profit. The coal so ordered was to be delivered "free on board" the cars at the Puritan mines—the purchaser and consignee paying the freight to points of destination within and without the state. There was evidence that the Puritan company was ready, willing and able to make such sales and deliveries and constantly demanded cars in order to enable it to fill these orders. Sometimes the carrier for days would fail to furnish cars, with the result that the company's mining operations were seriously interrupted. Sometimes the Puritan got cars but not the full number to which it was entitled on the basis of distribution according to mine capacity, although the Berwind-White Co. during the same period received more than its proportion.

In the lower court there was a total judgment for the coal company amounting to \$74,323.88. The railroad company

took the case to the Supreme Court, urging that the lower court had erred.

- (1) In holding that the state court has jurisdiction.
- (2) In failing to hold that under the Commerce Act the Federal Court alone had jurisdiction.
- (3) In holding that the business between the Puritan company and the railroad was intrastate business where coal was sold f.o.b. the cars at the mines.
- (4) In holding that the plaintiff could recover damages for failure to receive cars intended for use in shipping coal outside the state.
- (5) In adopting the method for distributing cars on which the damages were collected.
- (6) In failing "to take into account the private or individual cars, so-called, which were delivered to the plaintiff during the period of the action in determining the number which it would have been entitled to receive of the additional cars which the court has found should have been allotted to the region or district in which the plaintiff's mines were located."

When the railroad company appealed to the Supreme Court of the United States from the verdict as thus handed down, it urged that:

- (1) The determination of the proper basis for the distribution of cars was a matter calling for the exercise of the power of the Interstate Commerce Commission; (2) that no court had jurisdiction of a suit against it for discriminatory allotment until after the Commission had determined that its rule for distribution was improper; and (3) that no suit for damages against an interstate carrier could be brought for damages occasioned by a failure to deliver cars or for an unjust discrimination in distribution except in a United States Court.

In passing upon these matters the Court turns first to the question of jurisdiction under the Interstate Commerce Act and holds that the act in question "did not supersede the jurisdiction of state courts in any case, new or old, where the decision did not involve the determination of matters calling for the exercise of the administrative power and discretion of the Commission; or relate to a subject as to which the jurisdiction of the Federal courts had otherwise been made exclusive."

It then goes on to consider whether suits relating to discriminatory acts be confined to state courts. As to this "it must be" says the court's opinion, "borne in mind that there are two forms of discrimination—one in the rule and the other in the manner of its enforcement; one in promulgating a discriminatory rule, the other in the unfair enforcement of a reasonable rule. In a suit where the rule of practice itself is attacked as unfair or discriminatory, a question is raised which calls for the exercise of the judgment and discretion of the administrative power which has been vested by Congress in the Commission. It is for that body to say whether such a rule unjustly discriminates against one class of shippers in favor of another. Until that body has declared the practice to be discriminatory and unjust no court has jurisdiction of a suit against an interstate carrier for damages occasioned by its enforcement. When the Commission has declared the rule to be unjust, redress must be sought before the Commission or in the United States courts of competent jurisdiction as provided in section 9."

As to the claim that private cars should have been reckoned in and considered in determining the proper car apportionment the court finally concludes that:

Probably because of the carrier's own rule of distribution, there was no pleading raising such an issue, and there was no sufficient evidence as to the number of private cars received by the Puritan, the Berwind-White, or other companies. The information on that subject was peculiarly within the knowledge of the carrier and proof adequate to furnish a basis for the contention should have been offered—if, indeed, the carrier could have been heard to insist that private cars should have been counted when its own rule, as well as the general practice in the United States, was to exclude them in calculating the number of coal cars to which each mine was entitled. Neither need we inquire whether the fact that the Commission subsequently announced a rule, under which private cars had to be taken into account in making the distribution, could be given a retrospective effect. For, be that as it may be, the exception was properly disallowed, because, as held by the Supreme Court of Pennsylvania, no relevant evidence was offered to support the contention, and no point was raised during the trial, that private cars should be counted in the distribution.

### HARRISBURG, PENN.

In a rather emasculated condition the Catlin Bill No. 160 was on Apr. 7 reported out of the Mines and Mining Committee of the Senate.

There are but three sections in the bill left intact. The principal one is that allowing an attorney for a victim of a



mine accident to appear at the coroner's inquest. A slight amendment is inserted regarding the definition of a miner and as the bill now reads "any person competent to do the work of a miner" goes into the class of miners.

The section prohibiting the use of gasoline engines in the mines so as to prevent accidents from white damp is eliminated entirely, as is that compelling a man to work five years at the face cutting coal before being qualified to become a foreman.

The section pertaining to workmen's compensation is amended so that a company may go outside of the mine foreman class to select a foreman, but adds that a mine cannot be operated without a certified mine foreman. This the miners claim is a direct contradiction. The words "equally as competent" have been inserted.

The mine workers have asked that the interpretation of Attorney John G. Johnson as to what law is necessary to bring miners under compensation be incorporated in the Catlin bill, and this has been agreed to.

Representative Hugh L. Dawson, at the request of the attorney-general, introduced a bill on Apr. 7, providing that mine foremen and their assistants in and about the coal mines of the state shall be agents and employees of the operators of such mines, and shall be employed and discharged as are other agents and employees, and that operators shall be responsible for the acts and neglects of such mine foremen and their assistants as in the case of other agents and employees, and notwithstanding the employment of such mine foremen and their assistants, and shall at all times be under the supervision, management and control of such operators.

Representative Schaeffer has introduced a bill that no person under the age of 18 years shall be employed in any capacity whatever in or about any of the anthracite coal mines of the state for a longer period than 8 hours out of each day of 24 hours.

A bill to amend the act of 1911 providing for the powers, etc., of sealers of weights and measures, so as to include instruments and devices for weighing coal has been introduced by Mr. Dodds.

Mr. Hess, chairman of the Committee on Mines and Mining in the House, has introduced a bill which provides that the governor shall have the power to appoint a board of five men to hold examinations for mine inspector in the anthracite region and do away with the district boards. The governor is to make the appointments during the month of June, two of the members are to be engineers, and three miners. The board is to meet in Harrisburg on the second Tuesday in July following its appointment to prepare questions and answers, and on the fourth Tuesday in July examinations are to be conducted in Harrisburg.

Candidates must not be under 35 nor over 60 years of age. The governor will have the power to appoint any person who has received a percentage of 90 or over. The inspectors named during 1915 shall serve until Dec. 31, 1915 and the inspectors elected or appointed under the act of 1901 are to serve until Dec. 31, 1915, after Jan. 1, 1916, the term of all inspectors shall be for four years. In the case of a vacancy the governor is to appoint the person having the highest percentage of those who have received over 90 per cent. The anthracite district is to be divided into 25 inspection districts instead of 21 as at present.

#### PENNSYLVANIA

##### Anthracite

**Hazleton**—Flooded since 1899, although rich with virtually untouched veins of anthracite coal, Stockton mines, which are one mile from here, will be thrown open to operation again. The new tunnel to be driven from Hazleton to Butler Valley will tap the water in the Stockton workings.

It is reported that miners driving a rock tunnel at the Drifton colliery of the Lehigh Valley Coal Co. recently struck a thick bed of anthracite in a portion of the workings which were on the verge of abandonment. This discovery signified a considerable lease of life to the mine which has been in steady operation since 1863.

**Shenandoah**—The Mine Inspectors' Examining Board of Schuylkill, Northumberland, Dauphin and Columbia counties, examined 17 candidates for mine inspector on Apr. 6 and 7. There are 7 vacancies to be filled at the November election, but all candidates must have a certificate of eligibility before their names may be placed on the primary ballots. Mine Inspectors A. B. Lamb, P. C. Fenton, J. A. O'Donnell, B. I. Evans, P. J. Friel, John Curran and Charles J. Price, whose terms expire, are all candidates for reelection and took the examination.

**Pottsville**—The Philadelphia & Reading Coal & Iron Co. through its counsel, on Apr. 8, made a legal fight in court to have dissolved the injunction preventing it from using

the water of the Little Schuylkill River, for its collieries and locomotives. The company anticipates another severe drought like that of last year, and declares that it will be absolutely necessary to use this water. The water company contends that the Reading violated its charter in its furnishing water to the collieries of the Lehigh Coal & Navigation Co., from the river, whereas its charter only entitles it to furnish it for domestic purposes.

**Plymouth**—Several hundred men on Apr. 7 refused to work and declared a strike because the foreman prohibited them using the slope in going to or from their work. It being a violation of mining laws to trespass on slopes, the men must use the manway provided for that purpose, but this they refuse to do unless the company dampens the dust with which it is laden and kept in continuous circulation by mules which use the same passage in getting to the work of the vein.

**Wilkes-Barre**—At a conference recently held in this city it was decided to hold the Tri-District Convention of the United Mine Workers to formulate their demands to be presented to the anthracite operators at the expiration of their present agreement in this city on Sept. 7. It is thought that an increase of about 20 per cent. in wages will be asked.

**Bethlehem**—Navigation on the Lehigh Canal between Mauch Chunk, Bethlehem, Easton and Philadelphia was recently brought to a standstill by a strike of boatmen who demanded more money for conveying the coal from the mines to tidewater. Forty-three boats were at one time tied up at Walnutport alone.

##### Bituminous

**Connellsville**—The Connellsville coke trade shows a slight decrease, the production and shipment approximating 280,000 tons during the present week. There has been a marked increase in merchant production, the decline being due to decreased furnace demand. A sale of 40,000 tons of Pocahontas furnace coke for delivery, 6000 to 7000 tons per month for the next six months, is reported. This is the only transaction of importance in Southern coke in some months.

#### WEST VIRGINIA

**Fairmont**—At a meeting of operators from all sections of the state held here for the purpose of taking action to protect the industry against unwarranted legislative attacks, it was indicated that action may be taken looking toward the establishment of uniform prices for the product, graded in a proper manner. The evils of unrestricted competition and of price-cutting were pointed out, and the obvious remedy suggested. No agreement which might have the effect of making the proposed price basis illegal will be entered into, something on the order of the present circular plan being contemplated.

**Heberton**—The Willis Branch Coal Co., Thomas K. Laing, president, made its first shipment of coal a few days ago. This company is mining the Eagle Seam of the Kanawha measures and expects to produce between 4000 and 8000 tons per month.

#### KENTUCKY

**Lexington**—Students from all parts of Kentucky and some from West Virginia have matriculated in the practical miners' course which has opened at the State University here. All the classes are well filled.

**Domino**—The Himyar Coal Co. here has increased the output from 600 to 1200 tons daily and is now running every day in the week. Louis Des Cognets, manager of the operation, has just returned from the Northwest, where he secured some good-sized orders, so the plant will run regularly for some time.

**Hazard**—The Hazard Coal Co. made a record run one day recently, 15 cars being loaded. A little later the company expects to fill that number every day in the week.

**Ashland**—Because several stockholders were absent from the meeting recently held at Ashland where arrangements for the consolidation of several companies as the Kentucky River Coal Corporation was to have been perfected, the meeting was postponed. Some of the details also had not yet been arranged.

#### OHIO

**Columbus**—A death rate of three to every million tons of coal mined in Ohio in 1914 is reported by the State Industrial Commission, the figures being 59 deaths, to 18,500,571 tons of coal mined during the year, or one death to each 313,569 tons of coal. There were 162 deaths in 1913, but the difference is largely due to the general idleness in the eastern Ohio field during 1914.

Upon his own motion, Senator Vorheis, author of the bill pending in the Ohio legislature, seeking to regulate coal

rates in Ohio killed the measure. So much opposition to the bill developed that its friends did not want to bring it to a vote. Operators also lost the bill providing that all state institutions shall use Ohio coal only.

A bill has been introduced in the Ohio legislature appropriating \$6000 for the state mine department to establish "first aid" schools and stations at various mining camps. A portion of the money, if appropriated, will be available for the operation of the mine rescue car.

**Belleaire**—The resumption of the payment of strike benefits to miners in the eastern Ohio field occurred a few days ago, after a suspension of several weeks. Miners receive \$3 a week, women 50c. and children 25 cents. Community gardens are being prepared, for the purpose of enabling the men to get through the spring and summer as economically as possible, although it is rumored that a settlement on a 47-cent basis, run-of-mine, is being discussed by one of the large companies.

#### INDIANA

**Linton**—Prospects seem good in the Linton coal field for the summer months. Business is about up to the April average and in addition the Vandalia Coal Co. is to sink a new mine just south of this city while the Gould Co. has its 500 acres southwest of the city to open up.

**Terre Haute**—William Houston, who has retired as president of the Indiana Mine Workers, Henry Pigg, member of the executive board, and others have organized the Ohio & Indiana Collieries Co. and will operate a large coal stripping plant near Jasonville, Ind., which has been in operation about three months. There are 400 acres in the property.

#### UTAH

**Salt Lake City**—Application for an injunction to prevent the transfer of the Castle Valley Coal Co.'s holdings to the United States Fuel Co. in connection with the recent \$10,000,000 merger of four Utah coal properties was recently filed with the clerk of the United States District Court. The complaint set forth that by the carrying out of a resolution adopted by the board of directors of the Castle Valley Coal Co. on Mar. 13, 1915, holders of the company's stock will be forced to liquidate and accept in lieu of their stock shares in the United States Fuel Co. It is maintained by the plaintiff that this is unfair to the holders of stock that voted against the adoption of the resolution at the stockholders' meeting on Mar. 30, 1915, held in Evanston, Wyo.

### FOREIGN NEWS

**Tokio, Japan**—Three hundred miners were buried alive by a cave-in that wrecked the interior of a colliery near Shimonoeki, Apr. 13. The entrapped miners are 700 ft. below the surface and it is believed that their rescue is impossible.

### PERSONALS

Jonathan Bryan, of Richmond, Va., recently paid a visit of inspection to his properties in the Birmingham, Ala., district.

James H. Cassidy was recently removed by Federal Judge John H. Clarke from the receivership of the Cleveland & Pittsburgh Coal Co. Carl C. Friebohn was appointed in his place.

W. H. Cunningham has bought the interest of C. R. Conner in the engineering firm of which they were members, and will practice as a consulting mining engineer and geologist in Huntington, W. Va.

J. B. Whitnall, president of the Pennsylvania Coal & Supply Co., of Milwaukee, Wis., resigned on Apr. 10 on account of ill-health. He will continue to serve on the board of directors. Frank S. Peabody, of Chicago, was elected as his successor.

F. P. Wright, of Bevier, Ky., was recently reelected president of the Western Kentucky Coal Operators' Association. C. W. Taylor, of Central City, was named vice-president and D. Stewart Miller, of Owensboro, chosen secretary and treasurer.

A. F. MacKennon, for 16 years superintendent of the Pennsylvania Coal & Coke Corporation, has severed his connection with that company. Mr. MacKennon has not yet announced his plans for the future, but anticipates taking a trip through the South shortly.

Charles Finley, of Williamsburg, Ky., president of the

Proctor Coal Co., operating in Kentucky and Tennessee, has taken options on a large body of coal land in the Hazard, Ky., field and is having the same prospected, with the idea of buying and developing it at once if the prospects prove satisfactory.

B. J. Rowe, coal traffic manager of the Illinois Central R.R., recently testified in the Interstate Commerce Commission hearing of the Western freight rate case that more reductions than increases in the freight rates on soft coal would result from the Western railroads' proposed readjustments of rates on certain commodities.

Milton H. Smith, president of the Louisville & Nashville R.R. Co., and a number of the directors of the road recently concluded an inspection trip over the new Winchester-Irvine extension of the road. Freight has been carried over the road for a month or more and it is hoped that passenger traffic may be begun in the near future.

S. B. Warriner, president of the Lehigh Coal & Navigation Co., Attorney Thomas D. Shea, of Nanticoke, and State Labor Commissioner John Price Jackson were recently selected as a board of arbitration to settle the strike of the Wilkes-Barre street railway employees. Pending the decision of this board, the employees have returned to work.

L. P. Johnson, of Wallins Creek, Ky., recently resigned his position as superintendent of the Wallins Creek Coal Co., to take part in the organization of a new coal company which will soon open up a new mine in the Harlan field in Kentucky. Mr. Johnson expects to spend the present month in traveling before assuming his new duties.

L. D. Kniffin, sales manager of the Sheridan Coal Co., lately spent a few days at the company's mines in Paris, Ark., and in southern Kansas. He reports that only a small quantity of steam coal is now being taken from the mines and that otherwise everything is running in good shape. There is something of a shortage of steam coal on the local market.

Lynn W. Searles, mining engineer, of Birmingham, Ala., has been appointed consulting engineer for the Deepwater Coal & Coke Co., with headquarters at Evansville, Ind. This company is a syndicate formed to take over a large number of operations, in the western Kentucky field in the vicinity of Henderson, Uniontown and Morganfield, and furnish river transportation for them.

J. M. Roan, state mining inspector of Ohio, gave an examination to 21 applicants for the position of deputy mine inspector in Columbus, Apr. 9 and 10. Since the positions are under civil service all appointees must take the civil service examination. There is one vacancy in the service, in No. 4 district, and the appointment will be made as soon as the eligible list is completed.

Barney Day, of the Sanford-Day Iron Works Co., of Knoxville, Tenn., has assumed the indebtedness of the Dean Coal Co., of Artemus, Ky., which was recently placed in the hands of a receiver, and has taken over the mine, which he will put in operation at once. This property contains 6 ft. of the Dean seam of coal which is being worked, besides carrying the Jellico seam. It is understood that Mr. Day will offer the property for sale, as he is not a coal operator, and does not aspire to that honor.

John Mayer, president of the Mayer Coal Co., has been in southeastern Kansas for several days superintending the development of new mines. At Rabley the company is building one of the largest mines in the state and claims that it is one of the most up-to-date mines in America, since all the material used in the construction is steel. The mine is on the Sante Fe R.R. and the company expects to be operating it in three or four weeks. The mine will eventually have a capacity of 1000 tons daily.

### INDUSTRIAL NEWS

**Lorain, Ohio**—The Baltimore & Ohio dock at this port will start loading coal on or about May 1. The steamer "D. J. Morrell" is fitting out and will be ready to sail at that date.

**Pittsburgh, Penn.**—The Wilson-Snyder Mfg. Co. of Pittsburgh, Penn., has opened a branch office at 52 Vanderbilt Ave., New York City. This office will be in charge of A. H. Sherwood.

**Washington, D. C.**—Rates on bituminous coal from mines in Illinois and Indiana, to St. Paul and Minneapolis over the Chicago & Alton and other railroads were found not unreasonable Apr. 10, by the Interstate Commerce Commission.

**Lexington, Ky.**—It is estimated that the Lexington & East-



ern R.R. extension of the Louisville & Nashville, when present improvements are finished, will be able to handle about 10,000,000 tons of coal annually from the Elkhorn field in Kentucky.

**Hazleton, Penn.**—Contractor Lawrence Carey has a force of men engaged in driving a tunnel in the No. 23 slope at Trescow. This tunnel is being pushed with all possible speed, and when completed will develop a large body of coal chiefly in the thinner measures.

**Columbus, Ohio.**—J. M. Roan, Ohio mine and safety commissioner, has issued Bulletin A-4, dated Mar. 30. The bulletin takes up every fatal accident for the year 1914 and gives the causes in detail. The effort is made to teach other miners to avoid such accidents in the future.

**Columbus, Ohio.**—The Hocking Valley R.R. Co. has appealed the case where the Ohio Utilities Commission ordered the company to resume electric service on the branch between Wellston and Hamden to the Supreme Court of Ohio. A bond of \$5000 was given by the railroad company to appeal.

**Charlestown, W. Va.**—A petition in voluntary bankruptcy has been filed by the Hughes Creek Coal Co. The liabilities are placed at \$125,373.16 and the assets at \$150,162.56, the petition was filed by James Kay, president of the company, after the Board of Directors had met and decided that the company was insolvent.

**New Orleans, La.**—The "Captain Bud," the new \$50,000 tug built at Dubuque, Iowa, for the Bisso Towboat Co., which is managed by the New Orleans Coal Co., arrived in New Orleans recently and has been put in commission on the Mississippi and has made an important addition to the Bisso fleet.

**Washington, D. C.**—It has been informally announced that the Federal Trade Commission will make an early investigation into conditions in the Indiana and Illinois coal fields. Operators in these fields have been pleading with the Commission for its advice as to the best method for conducting their business in order to escape prosecution under the provision of the Sherman Anti-Trust Law.

**Bismarck, N. D.**—New lignite coal rates in North Dakota may be made on a basis that will be in the nature of a compromise between the rates established by the Legislature and declared confiscatory by the Supreme Court, and the rate formerly maintained by the railroads. Pending an anticipated conference between state and railroad officials, no steps are being taken by the railroads in the matter of establishing new lignite coal tariffs.

**Dante, Va.**—On June 26, 1914 the Clinchfield Coal Corporation awarded a \$50,000 contract to the Roberts & Schaefer Co. for the designing and building of a fireproof coal tippie at mine Nos. 2 and 5, similar to the one installed at Hurricane, W. Va. Just after the outbreak of the European war, the directors of the coal company suspended operations on this contract. They have now, however, authorized the immediate completion of this new plant.

**Fairmont, W. Va.**—The first trial growing out of the Farmington strike riot began here Apr. 12, before Judge W. G. Haymond, of the Circuit Court and Dock Ulrich, a Croatian miner, was called by the Commonwealth to answer a charge of the murder of Constable W. R. Riggs. One hundred and thirty-four men in all, are charged with murder, conspiracy to commit murder and riot. The trials of the other men are scheduled to follow that of Ulrich.

**Trenton, N. J.**—The Central R.R. of New Jersey was fined \$200,000 in the U. S. District Court on Apr. 5, for granting rebates to the Lehigh Coal & Navigation Co., for the shipment of coal from Nesquehoning, Penn., to points in Pennsylvania, New York and New Jersey. Sentences on 25 counts of an indictment of 185 counts on which the railroad was found guilty were imposed. An appeal will be taken by the railroad to the U. S. Circuit Court of Appeals.

**Charleston, W. Va.**—Figures showing the March shipments over the Chesapeake & Ohio R.R. indicate a gain of 85,655 tons over the preceding month, gains in the New River and Kentucky fields being responsible for the increase, as the Kanawha and Guyan districts both showed decreases. As compared with March, 1913, the movement was 157,000 tons less, the Kanawha output being only about half as large this year as last.

**Washington, D. C.**—Work on the new Bureau of Mines plant adjoining Schenley Park in Pittsburgh will be started in the near future. The Treasury Department announced on the afternoon of Apr. 10, that the contract for the construction of the main building had been let to the George W. Will Co., of New York, whose bid was \$287,540. The contract for grading and excavating the site was awarded to the C. A. Riffle Co., of Pittsburgh, the price being \$27,242.

**Norton, Va.**—Work was recently started on the government building which is to be used for a post office and federal mine rescue station and to cost \$90,000. It will be erected on the site formerly owned by the Norton Grocery Co. The building will be one of the most expensive and handsome structures in southwest Virginia. A United States mine rescue car with its crew will be stationed at this building for use in the southwest Virginia coal fields. It will be several months before the structure is completed.

**Cincinnati, Ohio.**—The United States Circuit Court of Appeals has affirmed the judgment of \$125,000 in favor of Mrs. Jean D. McKell recently handed down by the district court, against the Chesapeake & Ohio Ry. Co. This is the fourth time the case has been decided by the appellate court, and is the first time the judgment of the lower court has been sustained. The case was instituted by the late Thomas G. McKell, banker and coal operator, in 1902, and damages to the amount of \$3,575,000 were demanded from the railroad company by reason of its alleged failure to carry out an agreement for the development of West Virginia properties.

**Toledo, Ohio.**—A new coal-car dumper, costing \$360,000, will be put in service shortly by the Cincinnati, Hamilton & Dayton R.R. at Toledo. This is the first time a machine as large as this, with necessary extension to docks, has been constructed during winter weather. The new machine will pick up bodily a 75-ton car loaded with coal and dump the entire contents into a vessel returning the car to its track. It will handle cars of this size at the rate of 40 per hour. The Cincinnati, Hamilton & Dayton handled at Toledo for shipment by Lake to the Northwest during the 1914 season more than 2,000,000 tons of coal.

**Washington, Penn.**—A proceeding was recently instituted by George S. Harah, of Uniontown, to save from sacrifice the properties of Altha L. Moser, for whom Harah is receiver. Moser owns large coal holdings in this county and the court handed down a decree in which it was ordered that the exemplification of the record in Fayette County be filed among the equity records of this county. The outstanding obligations of Mr. Moser are placed at \$300,000, of which \$48,000 is personal indebtedness and unsecured. He owns 152 acres of coal in Washington County and 706 acres in Greene County. He also holds real estate in Pittsburgh and farm land in Fayette County.

**St. Louis, Mo.**—In the Supreme Court in New York City recently a decision was handed down that will be of interest to coal men in the Middle West. It was in the case of Robert Holmes vs. the directors of the St. Joseph Lead Co., in which the judge overruled the demurrer of E. C. Smith, vice-president of the St. Joseph Lead Co. and president of the Central Vermont R.R., and ordered that the case go to trial. This is a case of where the plaintiff demands that the directors sue certain coal companies in the Middle West that substituted Standard coal on Carterville coal contracts, causing the lead company to lose several hundred thousand dollars.

**Shamokin, Penn.**—An interesting and important case affecting the miners of this section was recently heard before Justice Heslop. The question involved was whether a contractor or the mining company is responsible for the pay of the men employed on a mine contract. A few months ago Louis Randall took a contract at the Colbert colliery. The work was more difficult than he had anticipated, and he did not make sufficient money on the contract to pay his employees the full amount of their wages. The men appealed to the company for pay which was refused. It is claimed that the operator or mining company is responsible for the pay of the men if the contractor fails. Justice Heslop upheld the contention of the workmen and entered a judgment in favor of the plaintiff for \$40. It is understood that this case in the form of a test suit will probably be appealed from the justice's decision in order to get the court's opinion on the question.

**Johnstown, Penn.**—As a sequel to the purchase by John D. Rockefeller of a controlling interest in the Consolidation Coal Co., an important trackage agreement has just been concluded between the Baltimore & Ohio and Western Maryland railroads, whereby the latter will gain access, with comparatively little construction work, to two coal fields off its present lines, and will share in the tonnage of a third field. It is estimated the Baltimore & Ohio's revenues will be affected to the extent of between \$700,000 and \$800,000 annually by the new arrangement. It will receive a rental for the use of its tracks. The coal fields involved in the competition for tonnage are in the Somerset and Fairmont districts. The Pennsylvania R.R. is already in the Somerset field and the New York Central recently completed a joint line into a portion of the Fairmont field. The future increase in production in these important fields may be the object of much more active competition than now exists.



## Coal Trade Reviews

### General Review

**Anthracite trade active in all departments. Improved sentiment in bituminous though movement continues light. Less tendency to force the market and contract prices are fair. Unfavorable outlook in Lake trade a depressing feature.**

The anthracite trade is shaping up in better form than anticipated, and the market will have no difficulty in absorbing the maximum production throughout the current month with the possible exception of some of the steam grades which are showing a tendency to drag. Shipments to Down East points are going forward as rapidly as the barge fleets can move. The general demand is undoubtedly less than normal which is due, in part, to the fact that collections are so slow that dealers are unable to purchase as heavily as usual. Shipments in the Lake trade will be slow in getting under way because of the large ice fields in Lake Erie. In the Middle West the demand is somewhat stronger, and the tonnage will closely approximate that of previous years.

There are undoubted indications of an improved undertone in the bituminous situation though the market continues irregular and rather mixed. Current prices undoubtedly rule slightly under the 1914 level, but there is less distress coal being forced on the market, and it is a significant fact that no particularly low bids are developing on any of the large public contracts, while there is a growing disposition to wipe out the differential over last year's prices. There is less tendency on the part of the operators to force the market, and the more cautious buyers are showing a greater interest.

The poor outlook in the Lake trade continues to exert a depressing influence in the Pittsburgh district, and buyers are still adverse to committing themselves on contracts, preferring to take their chances in the open market; they evidently plan to hold off contracting until late in the fall when they will endeavor to cover their requirements so as to insure a supply during the active period, occasioned by the possibility of a general suspension Apr. 1. Domestic coal has ceased to be a factor in the situation, but the steam demand has increased slightly though it is still substantially below the average.

The usual between-season dullness prevails in the Ohio market though there is a slightly better undertone. Coal is beginning to move towards the Lakes, but chartering is slow and it is clear that there will be no shipments of importance before July 1. What little demand there is centers entirely on slack coal, the supply of which is much curtailed as a result of the restricted mining operations.

In the Middle West the domestic coals have been more buoyant due essentially to the generally cool weather though some of the agencies are inclined to interpret this as an indication of an upturn in the trade. An improved sentiment is noted in the prompt market which is causing buyers to show more interest in contracts, and the steam coals are somewhat steadier. Mining operations are now on about the usual summer basis, and there is less free coal on the market. Unusually favorable crop reports are creating an improved sentiment in this section.

### BUSINESS OPINIONS

**Bradstreets**—This week's reports, trade and industrial, are the best noted for some time past, being in some respects the most favorable received since the spring of 1914.

**Dun's Review**—Influences favoring business are now more numerous and potent and there is unmistakable trend toward expanding activity. In certain lines conservatism continues the controlling policy and thus there is some irregularity, with the aggregate of transactions below producing capacity, trade development naturally being subject to the changes and checks produced by the international crisis.

**Financial Chronicle**—The performances now being witnessed on the Stock Exchange cannot be viewed with unconcern. The element of artificiality in them is altogether too patent to be ignored. The improvement in the situation is being used as the lever for boosting prices with a dazzling recklessness. If one may judge from Stock Exchange records,

manipulation is the governing factor in the speculation. Many of the stocks which have been taken hold of and whirled up so furiously must be assumed to have considerable intrinsic merit, but their worth remains to be tested, and in the meantime future prospects are being discounted with a freedom that staggers the beholder. The movement has now been continued for several successive weeks; and with each succeeding day the manipulators have been getting more bold, until it seemed as if, frenzied by success, they had now completely lost their heads, and become possessed with the idea that there was no limit or bound to which their daring and recklessness might not go without risk of ill-consequences.

**Boston News Bureau**—If general trade has not improved to a point that indicates enlarged wants and buying power, it is certainly in a position that warrants more hope and cheerfulness. There is a better undertone prevailing everywhere, and this is gradually changing sentiment and causing an inclination to expand. If the crop outlook continues promising, we shall probably see a quickening of activity from coast to coast. The time will come when the country will feel the effects of the economy which has been such a potent factor in the affairs of both corporations and individuals.

**American Wool and Cotton Reporter**—A duller season in the wool market for the last 25 years is not recalled, and the reason ascribed is the retrenchments made in the expenditures for clothing. This applies to the domestic business, of course, for Government orders have created an abnormal situation. If it were not for the foreign trade many mills would be idle.

**The Iron and Steel Industry**—The production of pig iron in March amounted to more than 2,000,000 tons, the highest record since May of last year. It is at the rate of 75% of the pig iron capacity of the country. Unfilled orders decreased 90,000 tons in March as compared with 350,000 tons in the corresponding month last year; the total unfilled orders now aggregate 4,200,000 tons. Foundry iron business has been slightly better. The automobile makers in Detroit took about 10,000 tons, and there have been other sales of merchant iron. Stocks of foundry iron decreased rapidly in March, and undoubtedly took care of the increase which piled up during January and February. Finished steel products are not in so good demand. There is quite a little heavy work, notably bridge work, which has come out within the last fortnight.

### ATLANTIC SEABOARD

#### BOSTON

**Pocahontas and New River prices fail to show expected weakness. More hopeful tone. Contract demand slightly improved. Georges Creek and Pennsylvania grades quiet at tide. Water freights easier. Anthracite being shipped freely.**

**Bituminous**—Prices on Pocahontas and New River are holding better than was expected. Recent bids on public contracts show no particularly low figures and there is more of a disposition on the part of shippers to accept the situation as they find it and not to try to force coal on a reluctant market. At the distribution points for inland delivery supply is still in excess of demand. Cargoes are absorbed very slowly. Only a few season orders are being placed now, and those mostly in the same channels as last year. Prices for the year on a delivered basis are usually found to be somewhat under the 1914 level.

The market for Georges Creek is not much improved. The shippers are very actively canvassing for business but prices are being held along the usual lines. The unfavorable weather has tended to retard arrivals and there has therefore been somewhat less pressure to move cargoes this week.

Cambria and Somerset coals are quiet at Tidewater but are still aggressive in the all-rail territory. New England is being thoroughly combed over for new business but buyers are rather unresponsive. Prices on these grades show small concessions as compared with a year ago.

Boston retail dealers reduced the current price for bituminous this week from \$4.65 to \$4.40 per short ton for

delivery by team. This is the lowest current price for more than two years and is the result of friction between some of the larger distributors.

**Water Freights** are easier, if anything; 80c. has been quoted on barge transportation, 3000 tons upwards, Hampton Roads to Boston, and the same figure still prevails on bituminous in anthracite barges from Philadelphia; 40c. is the current rate on barges from New York to Providence, 700 tons and up.

**Anthracite**—Shipments are coming forward as fast as the barge fleets can move, although some of the smaller dealers have already taken on all they can receive for the present. All the regular shippers are well supplied with orders for April, but May is expected to be slower. That some of the individual shippers have coal here on the market only serves to emphasize 1915 as a notably easy year to get anthracite forward on minimum prices.

Current quotations on bituminous at wholesale are about as follows:

	Clearfields	Cambrias Somersets	Georges Creek	Pocahontas New River
Mines*	\$0.90@1.40	\$1.15@1.60	\$1.67@1.77	
Philadelphia*	2.15@2.65	2.40@2.85	2.92@3.02	
New York*	2.45@2.95	2.70@3.15	3.22@3.32	
Baltimore*			2.85@2.95	
Hampton Roads*				\$2.60@2.75
Boston*				3.55@3.73
Providence†				3.50@3.73

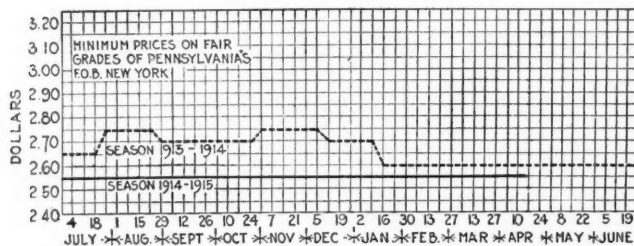
\* F.o.b. † On cars.

#### NEW YORK

The situation on new bituminous contracts regarded as favorable. Improved sentiment in the trade. Anthracite more active as the month advances. Summer outlook more optimistic.

**Bituminous**—Now that the religious holidays are over and the men back at work, coal is beginning to come forward again on a more uniform basis and a considerable tonnage is being moved over the piers, relieving any immediate prospect of demurrage conditions such as existed during March and before.

Reports from the leading soft-coal distributors indicate that contracts have been closing up in encouraging fashion, nearly all of last year's business being accounted for and at fair prices, equal in many instances to those which prevailed during the season of 1914-1915. Some concessions have been made to secure the business of a certain element which usually seeks to set its own prices but this is a small percentage of the whole. It can truthfully be said that general conditions are improving and that the spirit of optimism which has become evident in the trade is but a natural reflection of the general business improvement so noticeable in financial circles. The market is now quotable on the following basis: West Virginia steam, \$2.35@2.55; fair grades, Pennsylvania, \$2.55@2.65; good grades of Pennsylvania, \$2.70@2.80; best Miller Pennsylvania, \$3.05@3.10; Georges Creek, \$3.15.



**Anthracite**—With the collieries working full time again the usual tonnage is now being produced, with sufficient orders from the retail dealers to absorb each day's output. As the last half of the month approaches the activity seems to become more pronounced, the retailers being eager to get under cover for as much coal as possible at the April circular. From present indications the retail trade will not be able to make all the deliveries now on their books during this month.

Whether those who last month predicted April prices to prevail in the summer feel the same now is questionable, for there is no apparent desire to await that time. This prediction may be verified but it is most unlikely as the fear of labor troubles at the expiration of the present agreement hangs heavily over the situation and will become more ominous as the season advances.

Egg and stove are about in equal demand. Chestnut is moving easily but is not so active as the former two sizes. Pea is active apparently for filling in apartment houses, which business is always heavy at this season. The buckwheats are in good demand and No. 2 buckwheat in the better grades is really short with loading delayed for several days. There is no doubt that these sizes will be the leading factor

in a lively market which will characterize next fall and winter.

The anthracite market is now quotable on the following basis:

	Upper Ports		Lower Ports	
	Circular	Individual	Circular	Individual
Broken.....	\$4.60	\$4.60	\$4.55	\$4.55
Egg.....	4.85	4.85	4.80	4.80
Stove.....	4.85	4.85	4.80	4.80
Chestnut.....	5.10	5.10	5.05	5.05
Pea.....	3.55	3.35@3.55	3.50	3.15@3.50
Buckwheat.....	2.80	2.60@2.80	2.50@2.75	2.35@2.75
Rice.....	2.30	2.30@2.40	2.00@2.25	2.10@2.35
Barley.....	1.80	1.60@1.80	1.75	1.40@1.75

#### PHILADELPHIA

Outlook on anthracite favorable for balance of month, although small sizes are weak. Domestic grades in good demand. Bituminous inclined to drag, with no prospect for immediate improvement.

**Anthracite**—From the present outlook, there is likely to be little or no difficulty in disposing of the output of the domestic sizes for the balance of the month. Operators report a distinctly better attitude on the part of the trade, which indicates that the dealers are rapidly disposing of the surplus carried over from the winter months, and are in the market for fresh supplies. The steam sizes are likely to hamper operations as the warm weather approaches, as the demand for these will fall off sharply. This applies to the large apartment houses, hotels, department stores, and many industrial establishments.

Dealers claim to be having difficulty in securing egg coal and it is understood that the large companies are drawing on their stocks for this grade. Broken has eased off somewhat, and will probably be reduced to supply the call for other sizes. Stove coal is considerably easier than egg, and dealers experience little or no difficulty in securing all they require, promptly. Nut appears to be absorbed readily although the market is far from bullish on this size. Pea coal is generally held at \$2 at the mines. There is apparently a desire to push the sale of this grade coal rather than place it in stock, and this attractive price is having its effect, for the present at least; the circular is \$2.50 plus the tax, for line and local delivery. Altogether, the market presents a favorable aspect, with only weakness here and there.

Prices at Tidewater rule about as follows:

	Circular	Individuals
Broken.....	\$4.25	\$4.25
Egg.....	4.50	4.50@4.60
Stove.....	4.50	4.50
Chestnut.....	4.75	4.60@4.70

**Bituminous**—This branch of the trade still continues to evince little or no indications of improvement. It is understood that many contracts have been renewed on the old basis, but in some cases it has been necessary to make some slight reductions. The medium coals are still quoted about \$1 to \$1.10 at the mines, with the better grades \$1.35 to \$1.40.

#### BALTIMORE

Better feeling in the trade but spot business remains poor. Exports hold up well.

There is a stronger feeling in the trade. A number of large contracts were placed here the past week, and while prices are less than last years figures, there is a growing tendency to cut down the margin and purchasers who continue to hold off are likely to pay close to the old prices. That operators are stiffening up is evident. Interests in southern West Virginia have held a meeting at Fairmont with a view to fixing prices and the result will probably be no more cutting. Toward the end of the week operators refused to consider prices that have prevailed for several weeks past along contract lines.

Spot business remains very poor, however. In the gas coal section of West Virginia three-quarter and run-of-mine are about on a par, offering to the trade at the mines as low as 75 and 80c. Slack, is selling at 75c. and low grade steam coals from West Virginia were offering at 80 to 85c., with best grades around \$1.20. Pennsylvania coals ranged from 90c. to \$1.25.

The charters for the past week included the following:

Vessel	Nationality	To	Rate
Harrington	British	West Coast, Italy	\$10.56
Rio Perahy	British	West Coast, Italy	10.56
Bedebara	British	Savona or Genoa	9.60
Governor Powers		San Juan, P. R.	3.00

Note—Steamers are indicated by bold face type, all others being schooners.

#### HAMPTON ROADS

Exports and coastwise shipments holding up satisfactorily. Government takings during week heavy. Prices relatively firm.

The movement has been satisfactory considering existing conditions. The government has taken a large tonnage during the week to supply the battleships which have arrived



from Guantanamo. The coal movement by sail seems to be falling off somewhat as compared with March. Coastwise shipments were heaviest to Boston and Providence with other cargoes to Bath, Portland, Allyn's Point and Everett.

All of the large cargoes of the week have been New River and Pocahontas mine run although there have been several fair sized cargoes of nut and slack and high volatile going to the New England ports. Prices seem to be firm. The accumulation is being reduced somewhat and a number of shippers are rather short and urging the railroads to rush coal forward from the mines.

The new Collier "Ulysses" recently completed for the Canal Zone trade arrived in port during the week and after loading will go on her trial trip.

Although it is difficult at this time to predict what the movement for the month of April will amount to the prevailing opinion seems to be that dumpings will show up well. Dumpings over the N. & W. Ry. pier for the week ended Apr. 10 amounted to 141,134 tons.

Vessels clearing from Hampton Roads week of Apr. 2 to 9 inclusive were:

Norfolk			Newport News		
Vessel	Tons	Destination	Vessel	Tons	Destination
Alban	673	Para	Sif	4700	Fort de France
Windermere	3700	Vera Cruz	Frank W. Benedict	750	San Juan
Songa	4029	Havana	(Bk.) Bruz Hawkins	860	Maranhao
Ellen Little	1268	Para			
Rufford Hall	8617	Gibraltar			
Nor	1750	Georgetown			
Barbara	1132	St. Georges			
Howard Palmer	4006	Rio de Janeiro			
Tabor	5000	Canal Zone			
Wegadesk	6000	Canal Zone			
Falk	1185	Manzanillo			

Note—Steamers are indicated by **bold face type**, all others being schooners.

#### OCEAN CHARTERS

Coal charters have been reported by the "Journal of Commerce" as follows:

Vessel	Nationality	From	To	Tons	Rate
Itasca		Norfolk	Bermuda	989	\$4.00
Rio Pirahy	British	Baltimore	West coast, Italy	2297	
Bedebrun	British	Baltimore	West coast, Italy	2177	
Edward B. Winslow		Norfolk	Rio Janeiro	2482	8.50
Jacksonville		Philadelphia	Bermuda	547	3.00
St. Kilda	British	Virginia	River Plate	2469	9.36
Governor Powers		Baltimore	San Juan		
White Wings		Philadelphia	Mayport	1578	3.00
		Baltimore or	West Italy or	654	0.95
		Virginia	Sicily		10.54
Gardiner G. Deering		Philadelphia	Guantanamo	1714	
Henry O. Barrett		Philadelphia	San Juan, P. R.	1564	
Three Marys		Norfolk	Bermuda	1024	3.00
A. & M. Carlisle		Philadelphia	Jacksonville	302	0.95
Edith		Norfolk	Rio Janeiro	1051	
Sallie C. Marvil		Norfolk	Pernambuco	546	
T. W. Dunn		Philadelphia	Para or		
			Maranhao	635	5.75
James T. Maxwell, Jr.		Norfolk	Maranhao	461	
Alice M. Colburn		Baltimore	San Juan, P. R.	1335	

Note—Steamers are indicated by **bold face type**, all others being schooners.

#### OCEAN FREIGHTS

Since our last report we have chartered a number of steamers for export coal, principally to South American and West Indian ports, and rates are practically the same as a week ago.

To	Rate	To	Rate
Havana	\$2.50@2.75	Guantanamo	\$3.00@3.25
Cardenas or Sagua	2.50@2.75	Demerara	5.50@6.00
Cienfuegos	2.75@3.00	Bermuda	3.50@3.75
Port au Spain, Trinidad	2.75@4.00	Vera Cruz	3.50
St. Lucia	3.50@3.75	Tampico	3.50
St. Thomas	3.25	Rio	10.04
Barbados	3.75@4.00	Montevideo, Buenos	
Kingston	3.00@3.25	Aires or La Plata	9.36
Curacao	3.75@4.00	Mediterranean*	10.80
Santiago	3.00@3.25	Valparaiso†	8.40@9.60

Note—Rates noted in **bold face type** are only approximate.

\*To a direct port not east of the West coast of Italy, Spain excluded.

†With 800 tons per day discharge.

W. W. Battie & Co.'s Coal Trade Freight Report.

## LAKE MARKETS

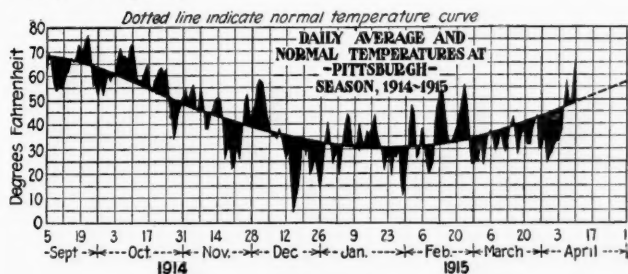
#### PITTSBURGH

Market shows no improvement and prices continue very irregular, with many consumers refusing to contract. Operations at 55 to 60% of capacity.

Demand for domestic coal continues light and no further activity of importance is expected in this branch of the market. Demand for steam coal has increased slightly but remains well below normal. Railroad demand has not increased to any noticeable extent as there is little more traffic moving than formerly. Demand for gas coal is very nearly normal, but prices are only a shade firmer for gas than for steam coal. What is injuring the market in particular is the poor

Lake trade prospects as very little coal is likely to move before July 1 and unless industrial conditions in the Northwest improve greatly the total movement this season in the Lake trade will be poor, and perhaps below that of last year.

Buyers still show an aversion to making contracts for the twelve-month and it seems probable that unless there is a decided improvement in general conditions and coal market prospects many consumers will buy prompt coal from time to time and not make contracts until late in the year, when they will presumably desire to have contracts to carry them to Apr. 1, providing coal in the period in which buyers will be stocking up against a possible suspension of mining for adjustment of the wage scale. The contract market continues to be quotable roundly on the basis of \$1.15 for mine-run, with shading possible on contracts at all desirable. Prompt lots are irregular, and asking prices, frequently shaded, may be quoted the same as last week: Slack, 90c@1; nut and slack, 95c.@ \$1.05; nut, \$1.05@1.10; mine-run, \$1.05@1.15; ¾-in., \$1.15; 1¼-in., \$1.25, per net ton at mine. Mining operations are at 55 to 60% of capacity.



#### BUFFALO

Little activity shown in bituminous. Contracts not so numerous as in most years. Operators begin to ship coal to the Lakes. Anthracite business good, but not so large as a year ago.

**Bituminous**—The same dullness prevails in the bituminous market and everybody complains of trade being lighter than usual for the spring season. A notable unwillingness to enter into contracts is prevailing and many buyers evidently expect to confine their purchases to the open market for some time to come. They have no difficulty in getting plenty of coal, though mine operations are not at more than half capacity. Business in Canada is exceedingly quiet; plants manufacturing war materials are working over time, but the number is not large and the Canadian tonnage has fallen off largely with many contracts suspended.

Shipments of bituminous coal to Lake points have started. The season will begin within the next week or so, and the car ferries across Lake Erie are already in operation. It is doubtful if the Lake business will be heavy until late in the season; buyers are showing indifference at present, because of the large stocks left over from last fall. The outlook is for a poor volume of business at the beginning of the season.

Pittsburgh prices show some weakness and trade in spot coal has dwindled down to a small basis. Some cutting of contract prices is reported, though most sellers will not close far ahead at reduced figures. Prices are \$2.80 for Pittsburgh select lump, \$2.70 for three-quarter, \$2.55 for mine-run and \$2.15 for slack, with Allegheny Valley sizes about 25c. lower than Pittsburgh.

**Anthracite**—The demand is running somewhat below that of last year, but most dealers are desirous of getting stocks at the April quotations. They are handicapped to some extent by the fact that their collections have been poor. Many have cut down their orders a third or so, while others are preparing to buy next month.

Shipments of anthracite up the Lakes will be slow in starting, because of the large ice fields at this end of Lake Erie. The nominal date for the opening is Apr. 15, but it will be some days after that before vessels can clear. The movement of water coal is likely to be on a less active basis than last spring.

#### TORONTO, CAN.

Trade quiet and marking time pending the spring discount.

The market is dull and featureless, the principal demand being for bituminous screenings. Supplies are now coming forward freely and the first cargoes by water are being received. Consumers are buying principally for immediate requirements until the spring reductions in price take place. Quotations for best grades are as follows: Retail anthracite egg, stove and nut \$8; grate, \$7.75; pea, \$6.75; bituminous steam, \$5.25; screenings, \$4.25 to \$4.50; domestic lump, \$6; cannel, \$7.50; wholesale f.o.b. cars three-quarter lump, \$3.56; screenings, \$2.90.



## TOLEDO

Some coal moving to the Lakes. Prices on certain grades well maintained. Pocahontas scarce.

The coal trade is improving some due in part to the cold weather of the past two or three weeks. Pocahontas egg is quite scarce and is holding firm at the circular price of \$1.60. Splint lump is in good demand at from \$1.15 to \$1.25. Slack continues strong and somewhat scarce, selling at from 55 to 60c. Some operators are shipping small quantities to the Lake. Real Lake business, however, will not commence until late in the season.

## COLUMBUS

Trade continues quiet. Domestic business about over for the season and little is doing in the steam market.

The domestic trade is about over for the season and dealers are devoting their attention to cleaning up stocks. The tone of the market is fair, despite the unfavorable conditions but future prospects are not considered particularly bright.

Some difference is reported on dealers' stocks. In some sections stocks are light but in others dealers have bought liberally and their supplies are large. Retail business is slow and only a few small orders have been received; prices remain the same as last week.

In the steam trade things are also quiet. Manufacturing does not appear to improve and consequently fuel requisitions are still small. Buying off the open market is the rule and cheap prices are given. There is considerable difficulty in renewing steam contracts, many of which expire at this time. Some railroad fuel business is reported but numbers of these contracts are still hanging fire.

Lake trade shows no signs of awakening. Chartering is slow and only a few bottoms have been contracted for. Reports from the docks of the Northwest show that the surplus carried over is larger than ever before and there is little likelihood of any Lake shipments until July 1 if that early.

Production in Ohio fields has been small during the past week. Reports received from the Hocking Valley, Jackson, Crooksville and Cambridge fields show an output of approximately 25% of normal. In the Pomeroy Bend field the output is about 40% of the average.

Prices in the Ohio fields are:

	Hocking Valley	Pomeroy	Kanawha
Rescreened lump.....	\$1.45	\$1.50	.....
1/2 and a quarter.....	1.30	1.35	\$1.30
Three-quarter inch.....	1.25	1.30	1.25
Nut.....	1.15	1.25	1.15
Mine-run.....	1.05	1.10	1.05
Nut, pea and slack.....	0.65	0.70	0.60
Coarse slack.....	0.55	0.60	0.50

## CINCINNATI

The demand for nut and slack has continued to strengthen. Other departments of the market are quiet.

The domestic market is extremely dull, although it can hardly be called abnormally so for a between-seasons period. The scarcity of screenings has increased, if anything; the obvious uselessness of trying to force the domestic market has caused producers to cut down their output of the prepared sizes still further, and nut and slack are strong. The general situation is regarded as fairly good, and hopes are expressed that the season will yet develop into a satisfactory one.

## CLEVELAND

Fine coal shows an unaccountable weakness. Lake shipping officially opens. Freight and insurance for the season.

Fine coal showed marked signs of being sold for lower prices at the beginning of the week with no apparent reason for the tendency. Lake coal is beginning to arrive.

Fine coal sold Monday at \$1.70 to \$1.75 with an undercurrent to the market that indicated still lower prices. Some Pennsylvania and West Virginia Lake coal is being produced, but the fine coal that was on the market did not come from the districts producing three-quarter for the Lake trade. Three-quarter and mine-run coals are selling as low as \$1.80. There was a good supply of coal on track Monday morning.

**Lake Trade**—In the Lake trade boats are being loaded for the first trip. The first cargo was loaded Saturday at Huron for St. Clair River points. Lake Superior coal is being loaded at Ashtabula and Lake Michigan coal is being offered, but not being taken. It is too early for most of the boats. Lake coal prices have not been made.

Navigation opened Thursday midnight but only a few boats sailed because it is not customary to send out ships on an opening trip on Friday. Insurance this year as 3% c. on steel vessels, but an effort is being made to advance cargo rates on coal and ore to 1/10 of 1% as against the 1914 rate of 1/20 of 1%.

The Sunday Creek Coal Co. has appointed W. S. & J. S. Manuel, agents for Lake transportation of Sunday Creek coal. About 500,000 tons will be shipped. The forwarding agents placed the coal for delivery at the principal Lake Superior and Lake Michigan ports at 30c. a ton.

Quotations on coal for shipment are:

	Pocahontas	Youghiogheny	Bergholz	Fairmont	W. Va. No. 8
Lump.....	\$2.95				
Lump, 1/2 in.....		2.20@2.25	2.00	\$1.90	\$1.90@2.00
Egg.....	2.95				
Mine run.....	2.45@2.50	2.10	1.90	1.80	1.75@1.90
Slack.....		1.80	1.75	1.70	

## LOUISVILLE

Operations down to a summer basis and there is still surplus coal.

Part time operations are the rule, while some mines are shut down altogether, and even at that it is reported stocks are accumulating. The domestic market is practically over for the season and the industrial and stocking demand is the only business that can be expected for several months. Reports of new operations to be opened up, extension of the rail facilities and combinations of mining operations, indicate greater activity than ever the coming fall and winter.

The best grades of block coal range from \$1.30 to \$1.60; 2x4-in. round, \$1.10 to \$1.20; run-of-mine, from 85c. to \$1, according to dimensions, with the top quality nut and slack 65 to 75c., all prices f.o.b. mines.

## NEW ORLEANS

Domestic business was particularly good during the past season. Interest of the New Orleans dealers will center this month on the big Government contract for coal to be delivered to the mouth of the Mississippi River.

Despite a dull market at present, there is some activity on the river front. England's recent orders have kept a great many ships from putting into this port for bunkering. The New Orleans Coal Co., the Monongahela River Consolidated Coal & Coke Co. and the W. G. Coyle Coal Co., which control practically all of the river bunkering, were the principal sufferers.

## COKE

## CONNELLSVILLE

No general activity, but slightly better tone. Production decreased slightly, following recent increases.

The coke market has shown a slight stiffening, though the change is largely a sentimental one, operators having come to expect somewhat better things for the future than formerly and being a trifle stiffer in their views as to prices. In the past week or ten days prompt furnace coke has been bringing \$1.55, apparently as minimum, whereas for some time it was easy to do \$1.50 on fairly desirable brands. There are still quotations at \$1.60 and \$1.65. Contracts extending to Jan. 1 would be quoted more strictly at \$1.75 than formerly and for any deliveries running into next year operators are talking above \$2. Prompt foundry is bringing \$2@2.35, according to brand, while contracts seem to be a shade stiffer at \$2.20@2.30.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Apr. 3 at 281,251 tons, a decrease of 3986 tons, and shipments at 278,014 tons, a decrease of 6699 tons.

**Buffalo**—Lack of trade is still reported and the demand shows no tendency to increase. Local handlers have done much less business than formerly this year. Prices remain the same at \$4.25 for the best 72-hr. Connellsville foundry and \$3.30 for stock coke.

**Chicago**—Some tonnage shipped here on consignment has been sold at prices below usual quotations. Improvement is noted in the buying of domestic sizes. Furnace and foundry coke shows no change, but gas house has declined. Quotations are as follows: Byproduct, \$4.45@4.75; Connellsville, \$4.65@4.75; Wise County 72-hr. (select), \$4.50@4.65; gas coke, \$3.85@4.1; furnace, \$4.45@4.65.

## MIDDLE WESTERN

## GENERAL REVIEW

Some improvement noted. Contracting unsatisfactory. Screenings steady.

Domestic coals have been more bullish, due to cool weather and buying of retail yards for household purposes. Although the market is not buoyant, it is felt by many that an upturn is in progress. The volume of coal moved from Indiana and Illinois mines is still moderate, and steam coals, if anything, have a better tone. The supply of screenings is about equal

to the demand, and in some districts the prices have advanced as much as 10c. per ton.

Renewals of contracts are unusually slow for this time of year and buyers continue holding back awaiting developments. The industrial situation looks brighter, however, and if the improvement is more marked the closing of contracts will soon be on in full swing.

Production has slowed down to what may be considered a normal summer basis and the minima prices for the Indiana and Illinois coals have now been seen. Mine operations are so restricted and prices better maintained that very little consignment coal is to be found. Reports on the coming wheat crop are favorable, and while a deficiency of moisture has existed, recent rains over nearly all the Western wheat-growing states have caused favorable prospects for another bumper crop. This condition should reflect favorably for the Illinois and Indiana operators later.

#### CHICAGO

**Better demand for domestic coals. Contracts closed on same basis as last year. Very little free coal offered. Anthracite about normal but considerable complaint as regards quality.**

Increased orders have been received by Indiana mines for domestic sizes, and screenings have been in demand. Such contracts as have been closed for Indiana coals are on the basis of last year's prices. The best quotations reported for domestic lump this week has been \$1.45 at the mines.

Southern Illinois screenings have been frequently sold at \$1 per ton, and many orders remain unfilled. The demand for domestic coals from this district has improved, and prices on all sizes are held steady.

In the Springfield district the situation shows slight improvement. More contracts have been closed for Springfield and Peoria coals than elsewhere, and it is said that some railroad business has been placed for another year at the same prices as last year.

Splint coals are flat, although there is little free coal on hand. But little contracting for these grades is reported thus far.

Eastern Kentucky coals are in a state of inertia, and few shipments have come into this territory. A little consignment coal has been sold at about 15c. per ton under regular quotations.

Hockings have been in fair demand, and prices well held. No free coal has been reported on the market this week.

The smokeless situation is spotty, although no consignment coal is reported on track. Contracting is slow, but jobbers in this territory are showing a good deal of activity in this respect. There is some placing of orders for prepared sizes for future delivery.

Anthracite buying is about equal to last year at this time. Independent anthracite shipments of inferior quality and preparation have come into this territory and sold at low figures. Some independents do not seem to realize that they cannot use the Western markets as a dumping place for their inferior production. Improvement is shown in buying at April storage prices, but retailers are slow in placing orders.

Prevailing quotations are as follows:

	Williamson and Franklin Cos.	Springfield	Sullivan	Clinton	Cartersville
Lump.....	\$1.20@1.35	\$1.25@1.35	\$1.35@1.45	\$1.25@1.30	\$1.50@1.65
4-in. lump.....	.....	.....	1.25	1.15@1.25	.....
Steam lump.....	.....	1.25	1.25	.....	.....
24-in. lump.....	.....	.....	1.35@1.45	.....	.....
14-in. lump.....	.....	.....	1.20@1.25	1.15@1.25	.....
Mine-run.....	1.00@1.10	1.00@1.05	1.05@1.10	1.00@1.10	.....
Egg.....	1.20@1.35	1.25@1.35	1.25@1.30	1.20@1.30	.....
No. 1 washed.....	1.15@1.35	.....	.....	.....	1.45@1.65
No. 2 washed.....	1.20@1.25	.....	.....	.....	1.40@1.50
3-in. egg.....	.....	.....	.....	.....	1.50@1.65
Nut.....	.....	1.25	1.15@1.25	1.10@1.20	.....
No. 1 nut.....	1.25@1.35	.....	.....	.....	.....
No. 2 nut.....	1.25@1.30	.....	.....	.....	.....
Screenings.....	0.90@1.00	0.85	0.80@0.85	0.80@0.85	1.00

	Saline Co.	E. Kentucky	N. Riv. & Pocon.	Somerset	Hocking
Lump.....	\$1.20@1.35	\$1.25@1.40	\$1.50@1.60	\$1.45@1.50	.....
4-in. lump.....	1.15@1.25	1.00@1.15	1.00@1.15	.....	\$1.40@1.50
Mine-run.....	1.05@1.10	1.10@1.15	0.90@1.25	1.00@1.15	1.00@1.15
Egg.....	.....	1.00@1.10	1.40@1.60	1.40@1.50	.....
No. 1 nut.....	1.25@1.40	.....	.....	.....	.....
No. 2 nut.....	1.20@1.35	.....	.....	.....	.....
Screenings.....	0.90@1.00	.....	.....	.....	.....

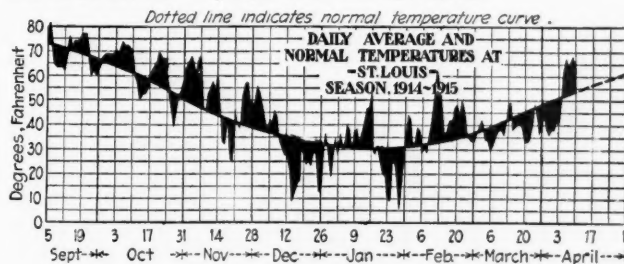
Knox and Greene County 5-in. lump, \$1.25; 3-in. lump, \$1.10 @1.15; 5-in. egg, \$1.15; 3-in. egg, \$1.10@1.15; mine-run, \$1 @1.15; screenings, 85 @90c.

#### INDIANAPOLIS

**Weather warm and consumption small in most lines. Contract-making proceeding satisfactorily at old prices.**

Mines are not making better than half-time, prices are at the summer level, retailers are buying sparingly and the railroad and industrial demand is quiet. The weather has been the warmest of the spring and house fires were unneces-

sary many days. This reduced the demand for domestic lump and consumers have about completed their season's purchases. The retailers are apparently not going to reduce prices to the summer level until the first of May. Slack is easily sold at around 80c. to 90c. according to the grade, and mine-run ranges from \$1 to \$1.20. Contracts are generally being renewed at satisfactory figures to the operators.



#### ST. LOUIS

**Market inactive and movement light. Important readjustment in marketing conditions. Anthracite movement normal.**

There is very little activity even in the steam sizes which should be strong. There seems to be no tonnage of any consequence moving from either the Standard or the high grade fields, and there is nothing to indicate any improvement. The only size in demand is No. 4 washed, and this scarcity is due to the Chicago contracts being short.

Arrangements have been practically perfected, with a few exceptions, for the distribution of coal in the St. Louis market from the mines on the various railroads. Some of these arrangements are now in working order, and others will go into effect shortly. An operator is selected on each railroad, who handles the tonnage of all the mines on that road, and sees that it is evenly distributed. This has a tendency to group the coals from the different roads, and maintain a standard price for them. Similar arrangements have not as yet been made in the Williamson and Franklin County field. In carrying out this plan, the selling expense is reduced to a minimum and the jobber eliminated; it is expected that the public will eventually get its coal at a lower figure than heretofore, and the operator realize a better profit at the same time.

There is a fairly good tonnage of anthracite moving in, and orders are being booked well ahead. Smokeless is dull with very little doing, and no indications of any improvement. There has been practically no change in the circular prices.

#### KANSAS CITY, MO.

**Both retail and wholesale business has suffered slight decrease. Prices unchanged.**

The coal business has practically reverted to the summer conditions. There is plenty of coal on the tracks and many of the mines in this vicinity have completely quit operating and others are operating on a short time basis. Steam coals are in about the same demand that they have been all winter and no decrease is expected by the operators. The demand for slack has not changed while other types have decreased in demand.

Prices are as follows:

	At Mines	Freight		At Mines	Freight
Cherokee lump....	\$1.85@2.00	\$0.80	Waverly nut.....	\$1.75	\$0.40
Cherokee mine-run.....	1.40@1.60	0.80	Novinger coarse....	2.00	0.60
Cherokee nut.....	1.85@2.00	0.70	Novinger nut.....	1.85	0.60
Cherokee mill.....	1.40@1.50	0.70	Arkansas semi-anthracite.....	2.50	2.00
Cherokee slack.....	1.35	0.70	Arkansas sizes.....	4.10	2.10
Lexington block....	2.00	0.40	Arkansas lump.....	3.85	2.10
Parlor block.....	2.10@2.50	0.40	Penn. chestnut.....	7.10	2.50*
Richmond.....	1.90@2.00	0.40	Penn. egg.....	6.85	2.50*
Waverly lump.....	1.85	0.40	Penn. grades.....	6.60	2.50*

\*To Chicago.

## PRODUCTION AND TRANSPORTATION STATISTICS

#### SOUTHWESTERN TONNAGE

The following is a comparative statement of the Southwestern tonnage for November and December and the years 1913 and 1914:

State	November		December		Year	
	1913	1914	1913	1914	1913	1914
Missouri...	290,958	252,105	266,335	285,547	2,924,728	2,762,211
Kansas.....	157,165	591,383	540,872	643,213	5,782,194	6,162,776
Arkansas...	187,703	141,554	138,678	123,737	1,943,861	1,643,881
Oklahoma..	346,064	332,515	324,728	352,267	3,534,842	3,379,031
Totals...	1,395,890	1,317,557	1,270,613	1,404,764	14,185,625	13,947,899

## CHESAPEAKE &amp; OHIO RY.

The following is a comparative statement of the coal and coke traffic from the New River, Kanawha and Kentucky districts for February and the eight months of the fiscal years 1914 and 1915, in short tons:

Destination	February				Eight Months			
	1915	%	1914	%	1915	%	1914	%
Tidewater.....	263,523	19	240,684	21	2,360,656	17	2,264,181	19
East.....	188,078	14	190,530	16	1,680,452	12	1,745,565	15
West.....	862,940	62	663,868	58	9,299,365	66	7,232,229	60
Total.....	1,314,541		1,095,082		13,340,473		11,241,975	
From Connections								
Tidewater.....					187			
Bituminous.....	74,365	5	55,494	5	729,494	5	727,218	6
Anthra. (local).....	143				248			
Anthracite.....	819		1,063		10,423		10,476	
Total.....	1,389,868	100	1,151,639	100	14,080,825	100	11,979,669	100
Coke.....	14,309		36,194		116,623		251,447	

## BITUMINOUS COAL MOVEMENT

The following is a summary of the movement of coal and coke over 13 principal railroads for January of the past four years, in short tons:

Anthracite	1912	1913	1914	1915
Baltimore & Ohio <sup>1</sup> .....	175,185	195,667	137,270	123,077
Chesapeake & Ohio <sup>1</sup> .....	3,155	378	1,043	769
Erie <sup>2</sup> .....	674,168	673,614	791,070	646,248
Pennsylvania <sup>1</sup> .....	1,040,535	1,014,259	915,027	894,529
Virginian <sup>2</sup> .....		89		98
Total 5 roads.....	1,893,043	1,884,007	1,844,410	1,664,721
Bituminous				
Baltimore & Ohio <sup>1</sup> .....	2,573,468	3,187,956	3,097,640	2,438,091
Buffalo, Roch. & P. <sup>1</sup> .....	716,888	774,052	817,259	595,512
Buffalo & Susq. <sup>1</sup> .....	145,562	143,814	147,581	92,381
Chesapeake & Ohio <sup>1</sup> .....	1,316,621	1,263,892	1,644,152	1,689,771
Erie <sup>2</sup> .....	47,313	60,373	9,980	11,256
Hunt. & Br'd T. Mt. <sup>1</sup> .....	99,612	150,149	105,739	21,839
New York Central <sup>1</sup> .....	761,810	886,742	835,458	825,761
Norfolk & Western <sup>1</sup> .....	1,687,948	2,069,874	1,965,814	1,886,938
Pennsylvania <sup>1</sup> .....	3,581,365	4,210,196	4,117,514	3,571,345
Pitts. & Lake Erie <sup>1</sup> .....	916,993	1,033,330	830,804	577,706
Pitts. Shaw. & North <sup>1</sup> .....	163,901	228,426	287,474	232,172
Virginian <sup>1</sup> .....	306,766	453,886	407,109	344,139
Western Maryland.....	208,901 <sup>4</sup>	289,342	291,002	314,334
Total 13 roads.....	12,527,148	14,752,032	14,557,526	12,601,245
Coke				
Baltimore & Ohio <sup>1</sup> .....	329,556	439,176	274,955	221,395
Buffalo, Roch. & P. <sup>1</sup> .....	38,548	57,831	28,780	33,834
Buffalo & Susq. <sup>1</sup> .....	28,796	28,153	33,495	49,774
Chesapeake & Ohio <sup>1</sup> .....	17,440	30,764	34,256	11,437
New York Central <sup>1</sup> .....	7,920	7,548		
Norfolk & Western <sup>1</sup> .....	131,640	148,251	118,745	70,215
Pennsylvania <sup>1</sup> .....	940,931	1,288,514	853,412	685,546
Pitts. & Lake Erie <sup>1</sup> .....	498,308	668,392	404,148	278,766
Pitts. Shaw. & North <sup>1</sup> .....	1,437	3,212		
Western Maryland.....	7,072 <sup>4</sup>	6,643	8,271	3,326
Total 10 roads.....	2,001,648	2,678,484	1,756,062	1,354,293
Total coal and coke 13 roads.....	16,421,839	19,314,523	18,157,995	15,620,259

<sup>1</sup> Includes coal received from connecting lines.

<sup>2</sup> Includes company's coal.

<sup>3</sup> Does not include company's coal hauled free.

<sup>4</sup> Does not include figures for Georges Creek and Cumberland R.R.

Note:—The Southern Railway hauled 296,919 short tons of bituminous coal during December, 1914, and 3,904,503 short tons during the twelve months ending December, 1914.

## EXPORTS

Coal exports for January of this year were as follows:

Districts	Anthracite	Bituminous	Coke
Maine and New Hampshire.....	430		
Maryland.....		89,779	668
Massachusetts.....	50		
New York.....	3,095	1,543	70
Philadelphia.....	1,127	40,648	799
Porto Rico.....		290	
Virginia.....		109,586	124
Mobile.....		424	
New Orleans.....	30	427	60
Arizona.....		2,586	
El Paso.....		33,828	14,151
Alaska.....		1	2
San Francisco.....	5		
Southern California.....		34	1
Washington.....		2,741	3,582
Buffalo.....	122,166	210,778	27,665
Dakota.....	748	5,863	3,208
Duluth & Superior.....	462	5,263	19
Michigan.....	100	54,404	4,874
Montana.....			1
Ohio.....		38,632	194
Rochester.....	1,342	7,912	139
St. Lawrence.....	60,249	28,405	1,786
Vermont.....	445	1	104
Total.....	190,299	633,145	57,474

Bunker Coal laden on vessels in the foreign trade was as follows, in gross tons:

Maryland.....	41,496
New York.....	250,102
Philadelphia.....	30,098
Virginia (Norfolk and Newport News).....	101,741

## ANTHRACITE SHIPMENTS

Anthracite shipments for March and the first three months of 1914-15 were as follows:

	March		3 Months	
	1915	1914	1915	1914
Phila. & Reading.....	961,415	936,304	2,415,915	2,698,223
Lehigh Valley.....	894,031	926,701	2,735,370	2,419,132
Cent. R.R. N.J.....	578,322	750,381	1,660,546	2,018,523
Del. Lack. & West.....	644,932	668,038	1,850,716	1,860,529
Del. & Hudson.....	617,605	446,135	1,785,877	1,475,406
Pennsylvania.....	544,023	585,190	1,367,597	1,547,408
Erie.....	593,250	660,924	1,706,140	1,900,534
Ont. & Western.....	151,820	191,030	472,879	542,131
Total.....	4,985,398	5,164,703	1,995,040	14,461,886

Stocks at Tidewater Mar. 31 were 873,698 tons.

## THE CAR SITUATION

Gross surplus of idle coal cars Apr. 1 was 145,069 as compared with 158,293 on Mar. 1. Shortage on the same dates was 33 on Apr. 1 and 14 on Mar. 1.

I. C. C. No. 5591—New England Coal & Coke Co. vs. Norfolk & Western Ry. Co.

Defendants make a charge for dumping coal into boats from their piers in the harbors of Norfolk and Newport News, Va., in addition to the regular transportation rate applying to the port on business destined beyond the Virginia capes; Held, That this practice is not unlawful. Complaint dismissed.

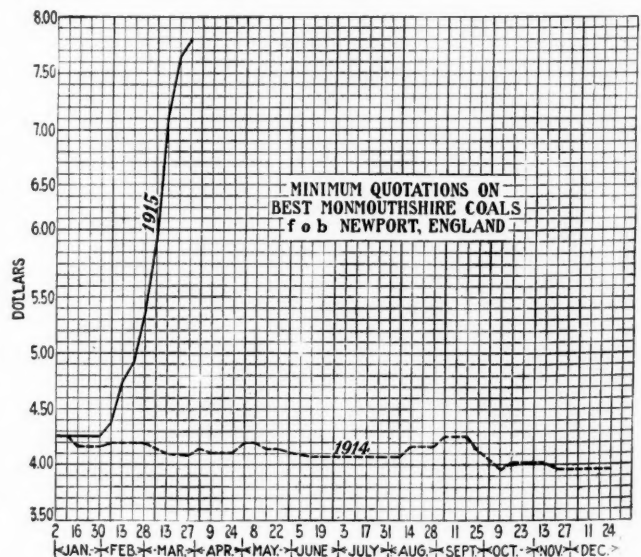
## FOREIGN MARKETS

## GREAT BRITAIN

Exports—British exports for February and the first two months of the past three years were as follows:

To	February		Two Months	
	1913	1914	1913	1914
Russia.....	107,742	138,417	333,782	377,421
Sweden.....	299,751	220,389	605,656	506,877
Norway.....	224,496	244,198	439,508	461,880
Denmark.....	270,765	202,057	530,229	448,074
Germany.....	594,211	584,564	1,262,617	1,137,997
Netherlands.....	186,459	139,634	388,881	267,046
Belgium.....	196,767	172,828	393,987	351,677
France.....	1,004,941	1,326,767	2,155,493	2,556,409
Portugal <sup>1</sup> .....	138,746	98,217	281,336	228,995
Spain <sup>1</sup> .....	343,732	293,684	705,205	639,305
Italy.....	765,695	865,145	1,587,082	1,655,750
Aus. Hung.....	144,032	81,904	281,587	154,746
Greece.....	59,406	80,171	100,237	126,462
Roumania.....	3,049		3,049	8,334
Turkey.....	9,186	63,075	25,958	103,294
Algeria.....	37,045	23,138	60,872	44,049
Portuguese <sup>6</sup> .....	28,863	46,638	4,065	82,036
Chile.....	150,448	162,795	46,404	290,359
Brazil.....	50,568	64,302	35,613	128,919
Uruguay.....	309,334	326,176	190,704	628,743
Argentina.....	10,542	12,759	9,761	23,815
Channel Is.....	26,551	19,868	40,019	63,345
Gibraltar.....	85,628	44,135	11,353	152,244
Malta.....	242,595	265,097	121,065	557,015
Egypt <sup>2</sup> .....	131,871	85,052	77,427	262,602
Aden <sup>3</sup> .....	16,483	11,481	27,636	23,560
India.....	26,540	19,845	365	31,313
Ceylon.....	13,678	26,206	9,022	38,054
Miscellaneous.....	90,793	113,335	30,655	185,844
Coke.....	98,755	94,595	74,296	205,850
Briquettes.....	154,253	154,136	81,108	350,992
Total.....	5,822,925	5,974,608	3,784,894	12,197,077
Bunker.....	1,539,410	1,615,132	1,501,083	3,297,089
Total.....				3,346,144

<sup>1</sup> Includes Azores and Madeira. <sup>2</sup> Including Anglo-Egyptian Sudan, <sup>3</sup> And dependencies. <sup>4</sup> And Canaries. <sup>5</sup> West Africa.





## Coal Contracts Pending

*The purpose of this department is to diffuse accurate information of prospective purchases and prices with a view to affording equal opportunity to all, promoting market stability and inculcating sound business principles in the coal trade.*

### Recast

This section gives a synopsis of items previously announced that will come up for consideration during the ensuing week, together with the number of the page on which the former notice appeared; also additional or supplemental information, such as bids, etc., on other old contracts.

**No. 287—Chambersburg, Penn.**—The Chambersburg Electric Light Department will be in the market during the current month for approximately 2000 tons of bituminous "Jerome" coal (p. 487). Address Supt. J. H. Mowrey, Chambersburg Electric Light Dept., Chambersburg, Penn.

**+No. 288—Troy, N. Y.**—The Board of Public Works will contract during April or May for about 1200 tons of egg and stove coal, to be used by the city schools (p. 487). Address Commissioner of Public Works, Troy, N. Y.

**No. 289—Chicopee, Mass.**—The Board of Education at this place usually contracts for coal in April (p. 487). Address Committee on Supplies, Chicopee, Mass.

**+No. 290—East Orange, N. J.**—The Board of Education will be in the market during April or May for about 1800 gross tons of anthracite coal (p. 487). Address Secy. Warren A. Clapp, Board of Education, East Orange, N. J.

**No. 335—Terre Haute, Ind.**—The Board of Education at this place will be in the market during the current month for approximately 4500 tons of 1½-in. No. 4 vein soft coal (p. 528). Address Board of Trustees, Terre Haute, Ind.

**No. 336—Albany, N. Y.**—The Board of Education will contract either in April or May for about 5000 tons of egg, chestnut and stove coal (p. 528). Address Board of Contract & Supply, City Hall, Albany, N. Y.

**No. 362—Portland, Ore.**—The bids on this contract (p. 566), which provides for furnishing coal for the local schools, have been duly referred to the Supply Committee, and awards are expected to be made on Apr. 19. Address School Clk. R. H. Thomas, Board of Education, Portland, Ore.

**+No. 372—Noblesville, Ind.**—We have been advised by the Union Sanitary Mfg. Co. that the present contract does not expire until Apr. 1, 1916 (p. 567). Address Pur. Agt. C. H. Ritchie, Union Sanitary Mfg. Co., Noblesville, Ind.

**No. 376—Marion, Ind.**—The Marion Paper Co. advises that it will not contract as noted in a previous issue (p. 567), but will buy its requirements for the present in the open market. Address Marion Paper Co., Marion, Ind.

**+No. 384—Savannah, Ga.**—The Savannah Electric Co. advises that this contract (p. 557) is handled through its Boston office. Address Stone & Webster, 147 Milk St., Boston, Mass.

**+No. 397—Lorain, Ohio**—Bids will be received until noon, Apr. 19, for furnishing coal for the school year 1915-16 to the Board of Education (p. 567). Address Clk. E. Bruell, Board of Education, High School Bldg., Lorain, Ohio.

**+No. 432—Minneapolis, Minn.**—The Board of Education at this place will be in the market during April or June for about 15,000 tons of bituminous and semibituminous coal (p. 626). Address Business Agt. F. E. Reidhead, Board of Education, 407 City Hall, Minneapolis, Minn.

**+433—Reading, Penn.**—The Board of Education at this place will be in the market during April or May for approximately 2500 tons of pea, egg and stove coal (p. 626). Address Secy. F. Roland, Jr., Board of School Directors, Reading, Penn.

**+No. 435—Gloversville, N. Y.**—The Board of Education at this place will purchase about 800 tons of egg coal during May or April (p. 626). Address Supply Committee, Board of Education, Gloversville, N. Y.

**+No. 436—West Point, N. Y.**—Sealed proposals in triplicate will be received until 2 p.m., Apr. 26, for furnishing anthracite coal required at the U. S. Military Academy during the fiscal year ending June 30, 1916 (p. 626). Address Quartermaster, U. S. Military Academy, West Point, N. Y.

**+No. 438—Fort Reno, Okla.**—Sealed proposals will be received until noon, Apr. 22, for furnishing coal required

during the fiscal year, commencing July 1, 1915 (p. 627). Address Depot Quartermaster, Fort Reno, Okla.

**No. 440—Chicago, Ill.**—The American Compound Door Co. will be in the market about Apr. 20 for a month's supply of Franklin County, Illinois, No. 2 nut coal (p. 627). Address the Purchasing Agent, American Compound Door Co., Chicago, Ill.

**+No. 445—National Soldiers' Home, Tenn.**—Sealed proposals will be received until 2 p.m., Apr. 19, for furnishing and delivering 10,500 tons of bituminous coal to the National Soldiers' Home, Mountain Branch, N. H. D. V. S. (p. 627). Address Treas. Oliver K. Marshall, Mountain Branch, N. H. D. V. S. National Soldiers' Home, Tenn.

**+No. 453—Fort Keogh, Mont.**—Sealed proposals will be received until 11 a.m., Apr. 26, for furnishing 600 tons of lump coal and 150 tons of pile-run coal, at the Fort Keogh Remount Depot, Mont. The storage capacity is 400 tons lump and 150 tons pile-run (p. 627). Address Depot Quartermaster Capt. Sam. Van Leer, Fort Keogh Remount Depot, Mont.

**No. 465—St. Louis, Mo.**—It is estimated that the tonnage on this contract (p. 627), which covers the requirements for the Board of Education at this place, will run about 10% ahead on the bituminous coal used last year, and slightly less on the anthracite. Address Supply Comr. E. M. Brown, 3431 School St., St. Louis, Mo.

**+No. 473—Portland, Ore.**—Sealed proposals will be received until Apr. 20, for furnishing the steam and lump coal required for vessels and stations of the 16th and 17th lighthouse districts (p. 628). Address Lighthouse Inspector, Portland, Ore.

**+No. 476—Jeffersonville, Ind.**—Sealed proposals will be received until 10 a.m., Apr. 21, for furnishing bituminous coal to the Jeffersonville depot during the period ending June 30, 1916 (p. 628). Address Maj. Joseph T. Davidson, Jeffersonville, Ind.

**+No. 496—Malden, Mass.**—The requirements of the local Board of Education as noted in previous issue (p. 665) are purchased by the Joint Standing Committee on Fuel, which at the same time contracts for all the city requirements. The tonnages required this year are as follows: 2500 tons of hard white ash furnace or egg coal, 250 tons of hard white ash stove or nut coal, 200 tons of bituminous coal. The anthracite coal is to be delivered in the bins of the several buildings as may be designated previous to May 1, 1916, and the bituminous is to be delivered as may be required by the Street and Water Commission. In addition to this, 250 tons of hard white ash stove or nut coal will be required for delivery in various parts of the city in quarter-ton lots as may be designated by the Overseer of the Poor or Soldiers' Relief Committee. All bids must be accompanied by a certified check for \$500. Address Clerk of Committees John L. Gilman, City Hall Building, Malden, Mass.

**No. 512—Chicago, Ill.**—The Barber Asphalt Paving Co. will be in the market about Apr. 25 for one car per day of southern Illinois screenings (p. 666). Address Purchasing Agent, Barber Asphalt Paving Co., Chicago, Ill.

**+No. 520—Jeffersonville, Ind.**—Sealed proposals will be received until 10 a.m., Apr. 21, for furnishing the Depot of the Quartermaster's Corps with such quantities of bituminous coal as may be required during the year commencing July 1, 1915 (p. 666). Address Depot Quartermaster Maj. Joseph T. Davidson, Jeffersonville, Ind.

**+No. 521—Front Royal, Va.**—Sealed proposals in triplicate will be received until 2 p.m., Apr. 21, for furnishing about 345 tons of anthracite coal to the Front Royal Remount Depot (p. 666). Address Depot Quartermaster, Front Royal, Va.

**+No. 523—Xenia, Ohio**—Sealed proposals will be received until noon, Apr. 22, for furnishing about 470 tons of Pocahontas mine-run coal and 150 tons of Hocking lump coal (p. 666). Address Clk. B. Schlesinger, 33 East Main St., Xenia, Ohio.

**No. 525—Washington, D. C.**—Awards on this contract (p. 666) are still being considered pending the results of tests now being conducted by the Navy Department on the coal of the Clinchfield Coal Co., which was the lowest bidder at \$2.50. Address Paymaster-General of the Navy Samuel McGowan, Washington, D. C.

†No. 527—San Francisco, Calif.—Bids on this contract (p. 666) will be received until 11 a.m., Apr. 30, instead of Apr. 23, as previously announced. The requirements are as follows:

Posts	Domestic	Steam
Fort Davis, Alaska.....	785	430
Fort St. Michael, Alaska.....	1,250	250
Fort Lisicum, Alaska.....	730	250
Fort Wm. H. Seward, Alaska.....	2,000	...
Fort Lawton, Washington.....	1,800	...
Fort Casey, Washington.....	2,000	...
Fort Flagler, Washington.....	1,750	...
Fort Ward, Washington.....	800	...
Fort Worden, Washington.....	2,500	...
Fort George Wright, Washington*.....	1,000	...
Fort Yellowstone, Wyoming.....	2,600	...
Fort Missoula, Montana.....	2,360	...
Fort Columbia, Washington.....	600	...
Fort Stevens, Oregon†.....	1,725	\$900
Vancouver Barracks, Washington†.....	5,000	...
Fort Baker, California.....	700	...
Fort Barry, California.....	1,200	...
Fort Mason, California.....	200	90
Presidio of San Francisco, California....	10,000	...
Letterman General Hospital, San Francisco, Calif.....	300	...
Fort Winfield Scott, California.....	1,000	200
Fort Milley, California.....	1,000	...
Fort McDowell, California.....	3,300	2,000
Alcatraz Island, California.....	900	...
Fort Douglas, Utah.....	1,500	...
Presidio of Monterey, California.....	3,000	...
Fort Rosecrans, California.....	360	...
Signal Corps Aviation School, San Diego, Calif.....	300	...

\*Railroad station at Fort George Wright, and if proposals are made for post delivery, same should be on basis of f.o.b. cars Fort George Wright, Washington.

†Railroad stations at Fort Stevens and Vancouver Barracks, and if proposals are made for post delivery, same shall be on basis of delivery into bins or other places of storage at post.

‡For delivery at Astoria, Ore., aboard harbor boats.

Bidders are required to state a base price for delivery at the mines or at seaboard, the cost of transportation to the various posts and the cost of handling in each case. Payment will be made on the basis of analysis of samples taken as provided for in the specifications. Other conditions being equal, preference will be shown to bidders in this country as against those in foreign countries. Address H. S. Wallace, care Quartermaster Corps, "Chronicle" Bldg., San Francisco, Calif.

## New Business

No. 534—Chicago, Ill.—The Booth Fisheries Co will be in the market about May 15 for a contract for one year for five cars per week of No. 2 Illinois or Indiana washed nut. Address Purchasing Agent, Booth Fisheries Co., Chicago, Ill.

No. 535—Louisville, Ky.—The Whiteside Bakery Co. will be in the market in May or early June for one year's supply of gas house coke. They usually consume one car load a week. Delivery by rail on Pennsylvania terminal. Address, W. Raven, Whiteside Baking Co., 14th and Broadway, Louisville, Ky.

†No. 536—Menominee, Mich.—The Marinette Light & Traction Co. of this place will soon be in the market for approximately 4000 tons of gas coal. Prospective bidders may obtain a copy of specifications on request. Address A. R. White, Menominee & Marinette Light & Traction Co., Menominee, Mich.

No. 537—Vicksburg, Mich.—The Vicksburg Governor Co. at this place will contract shortly for 750 tons of Hocking mine-run coal. Address Secy.-Mgr. F. X. Cullinan, Vicksburg Governor Co., Vicksburg, Mich.

No. 538—Kalamazoo, Mich.—The Kalamazoo Stove Co. at this place will soon be in the market for its annual requirements of coal, which will be approximately 3000 tons. Address Secy. to Gen. Mgr. Morgan E. Persnig, Kalamazoo Stove Co., Kalamazoo, Mich.

†No. 539—North Madison, Ind.—Bids are requested for furnishing the Southeastern Hospital for the Insane, situated near this place, with approximately 15,000 tons of the best quality Pittsburgh nut and slack coal mixed, or its equivalent, deliveries to be as required at the Power House, which is situated on the P. C. C. & St. L. switch from North Madison. Bids will also be received for the same grade of coal as may be required at the Water-Works Pumping Station near West Madison, delivery by wagon. Address Medical Supt. E. P. Busse, Southeastern Hospital, North Madison, Ind.

†No. 540—Knoxville, Tenn.—Bids will be received on or before Apr. 24 for furnishing the Southern Ry. Co. with a large quantity of Alabama mine-run coal. The following information is to accompany each bid: Price, f.o.b. mine; freight rate to Southern Ry. point; name and location of mine; average daily output; method of mining coal; name of seam

worked; whether company is incorporated; name of operator; analysis of coal. Shipments are to be made in equal monthly installments beginning July 1, 1915, and ending June 30, 1916. Address Fuel Agt. E. G. Goodwin, Southern Ry. Co., Knoxville, Tenn.

†No. 541—Toronto, Can.—The Public Works Department of the Provincial Government of Ontario requests bids for coal as follows: Parliament Buildings, 2300 tons of pea coal; 100 tons of small egg coal. Ottawa Normal School, 405 tons of small egg coal; 15 tons of soft coal. North Bay Normal School, 75 tons of small egg coal. Osgood Hall, Toronto, 1100 tons of anthracite; 5000 tons of slack. Normal School, Toronto, 450 tons of hard egg coal; 30 tons of soft coal. Government House, Toronto, 175 tons of stove and nut; 20 tons cannel coal. London Normal School, 140 tons of small coal. Peterboro Normal School, 175 tons small coal. Stratford Normal School, 125 tons of small coal. Brantford School for the Blind, 90 tons anthracite; 80 tons soft coal. Belleville School for the Deaf, 130 tons hard and 1600 slack coal. Address Department of Public Works, Toronto, Can.

†No. 542—Chicago, Ill.—The Buda Foundry Co. will purchase from time to time on the open market, about three cars per week, Illinois or Indiana lump, commencing about May 15. They will also purchase about six cars per annum of Youghiougheny ¾-in. screenings and three cars of good blacksmithing coal; they will be in the market about June 1 for this latter supply. Address, Purchasing Agent, Buda Foundry Co., Chicago, Ill.

No. 543—Toronto, Can.—The Board of Education will contract next month for 7500 tons of soft coal and 7500 tons of hard coal, including egg, nut and stove. A large percentage of this is to be delivered at various city schools after July 1. Address, Wm. Kerr, Clerk of Supplies, Board of Education, Toronto, Can.

No. 544—Louisville, Ky.—The new Galt House Co. uses between 10 and 12 tons of coal, nut and slack, daily, but makes its purchases in the open market. Address Pres. Jacob Greenberg, New Galt House, Louisville, Ky.

No. 545—Louisville, Ky.—Ballard & Ballard, miller, is preparing to let its annual contract, effective July 1, for approximately 15,000 tons of nut and slack and pea and slack coal. The contract is let in accordance with the company's test system. Address Chf. Engr. Charles W. Clayford, Ballard & Ballard, Louisville, Ky.

No. 546—St. Joseph County, Ind.—The Board of Commissioners will receive sealed proposals for 600 tons of Pocahontas or New River smokeless coal, mine-run, 60% to be lump coal, to be delivered at the county jail. Dealers must submit analysis and the name of the mine in the bid. Also 500 tons of 6-in. lump steam coal, to be delivered on board cars at Muesel's switch for county asylum during the months of July, August and September, at the rate of two cars per week; one car of chestnut anthracite coal will also be required at this place. All proposals must be on forms furnished by the County Auditor and must be in on or before Apr. 26, together with the proper bond. Address Auditor Clarence Sedgwick, South Bend, Ind.

No. 547—Louisville, Ky.—The Louisville Milling Co. (local branch of the Washburn, Crosby Co.) has completed tests of several grades of steam coal and is preparing to let a contract for its annual supply of 8000 tons. It uses nut and slack principally. Address Auditor Leonard C. Lang, 222 West Burnett St., Louisville, Ky.

†No. 548—Washington, D. C.—Proposals will be received until 2 p.m., May 3, for furnishing the Government of the District of Columbia with coal as follows: Bituminous: 2000 tons of mine-run for delivery at Blue Plains, D. C.; 700 tons for delivery at the Industrial Home School and the Tuberculosis Hospital; 15,000 tons for delivery at any point in the District of Columbia; 125 tons of semibituminous (splint) for use in the Fire Department steamers; 6000 tons of mine-run for use at the District Pumping Station; 6000 tons for the District Pumping Station to be called for when required; 2500 tons for delivery at District Buildings; 4800 tons for delivery at the Sewage Pumping Station; 6000 tons, 1000 tons and 4000 tons for delivery at the Workhouse. Anthracite: For delivery at any point in the District of Columbia, 450 tons of Lykens Valley stove; 650 tons of red ash stove; 100 tons of white ash chestnut; 5000 tons of white ash egg; 1000 tons of white ash furnace; 1400 tons of white ash stove. Anthracite for delivery at the Industrial Home School and the Tuberculosis Hospital, 550 tons of white ash furnace; 40 tons of white ash stove; 40 tons of white ash chestnut. For deliveries in car lots at Institutions at Blue Plains, D. C., 75 tons of white ash stove; 50 tons of white ash chestnut. Forty tons of Connellsville coke will also be required to use at the District Pumping Station. Deliveries are to be made during the fiscal year beginning July 1, 1915. Prospective bidders



should apply for specifications and proposal form. Address Purchasing Officer, D. C., Room 320, District Building, Washington, D. C.

**+No. 549—St. James, Mo.**—Sealed bids will be received at the Federal Soldiers' Home up to 12 o'clock noon on May 1, for 40 carloads of coal to be delivered during the next year. Address Supt. J. P. Brinegar, Federal Soldiers' Home, St. James, Mo.

**+No. 550—Norfolk, Va.**—Sealed proposals will be received at the United States engineer office until May 7, 1915, for furnishing about 3000 tons of bituminous coal. Address Lieutenant-Colonel of Engineers Pervey, United States Engineer Office, Norfolk, Va.

**No. 551—La Porte, Ind.**—The Great Western Manufacturing Co., manufacturer of crank hangers and cycles, will be in the market for a contract covering steam coal for next season, and will test out various coals to see which is most economically suited for their purpose. Address Pres. E. J. Lonn, Great Western Manufacturing Co., La Porte, Ind.

**No. 552—Rochelle, Ill.**—The Geo. D. Whitcomb Co., manufacturer of mining machinery, is in the market for its steam coal requirements for next season. The company prefers Southern Illinois coals. Address Gen. Mgr. W. C. Whitcomb, Geo. D. Whitcomb Co., Rochelle, Ill.

**No. 553—Toronto, Can.**—The Manitoba Division of the Canadian Pacific Railway, which formerly obtained its coal supply from the East, will in future use coal from the mines in the Crow's Nest Pass district and will require at least 1000 tons per day.

**+No. 554—Governors Island, N. Y.**—The Department Quartermaster, Eastern Department, U. S. Army, received bids until Apr. 14, to supply the fuel requirements at the 69 army posts of the department for the fiscal year beginning July 1. The requirements include anthracite, nut, stove, egg, furnace, and pea coal, and mine-run bituminous in various tonnages, running up to as high as 4048 tons. Payment will be made on an analysis basis. Complete details, together with blank forms and specifications may be had on application. Address Department Quartermaster, Eastern Department, Governors Island, New York.

**+No. 555—Bridgeport, Conn.**—The Board of Education at this place will be in the market for approximately 3500 tons of the best quality Lehigh anthracite some time during May. This business is let on a yearly contract, the figure last year being \$5.75. Address Board of Contract and Supply, Dept. of Education, City Hall, Bridgeport, Conn.

**+No. 556—Grand Rapids, Mich.**—The local School Board will be in the market some time during May for its annual supply of coal. The call for bids is advertised, and the sale negotiated on a specification basis. Kanawha slack coal is used in the stokers and Pocahontas or New River mine-run for hand firing. Last year's contract provided for 3700 tons of Kanawha at \$3.13 per ton, and 3750 tons of Pocahontas at \$3.82 per ton. Address the Board of Education, Grand Rapids, Mich.

**+No. 557—Brockton, Mass.**—The Highway Commission at this place will contract some time during May for the annual supply of coal for the local school. Both anthracite and bituminous are required, the gross tonnage aggregating about 3000 tons last year. Address Highway Commission, City Hall, Brockton, Mass.

**+No. 558—Hamilton, Ohio.**—The local Board of Education will contract about the middle of May or the first of June for its annual supply of coal. Last year about 1400 tons of smokeless mine-run was bought. The call for bids is advertised, and the business goes to the lowest and most desirable bidder. Address Clk. Charles F. Holdefer, Board of Education, 209 S. Second St., Hamilton, Ohio.

**+No. 559—Bremen, Ind.**—The local Light and Water Department at this place will be in the market about May 15 for its annual requirements of coal. Last year about 2000 tons of Youghiogheny was purchased at \$3.15 delivered in bins. The business is done on a competitive basis. Address Light and Water Plant, Bremen, Ind.

**+No. 560—Auburn, N. Y.**—The local School Board will contract some time during May for their annual supply of coal involving about 900 tons of anthracite egg. This business was closed at \$6.10 last year. Address Supply Committee, Board of Education, 144 Genesee St., Auburn, N. Y.

**+No. 561—Racine, Wis.**—The local School Board will contract some time during next month for their annual requirements of coal involving about 2000 tons of Pocahontas mine-run. Last year this business was closed at \$4.40, \$4.45, and \$4.50 per ton. The contract is let to local dealers and the price is more or less dependent upon the haul. The call for bids is advertised. Address Board of Education, Racine, Wis.

**+No. 562—Clarksdale, Miss.**—The city government will con-

tract some time next month for their annual requirements of coal, amounting to approximately 5500 tons, this business being closed at \$2.64 per ton last year. The contract is let on a competitive basis, and mine-run coal is required. Address W. S. Bobo, City of Clarksdale, Miss.

**No. 563—Lanett, Ala.**—The Lanett Cotton Mills at this place will contract some time during the summer for their annual requirements of fuel, involving about 10,000 tons of nut coal. On last year's business "Empire" coal was used, the price being about \$2.50 per ton. Address Supt. George S. Harris, Lanett Cotton Mills, Lanett, Ala.

**+No. 564—New Orleans, La.**—Sealed proposals will be received for furnishing the United States Plant at South Pass, La., for its annual requirement of coal, until 11 a.m., May 3. About 13,500 tons will be required at the government coal yard at Port Eads, or Burwood, La., delivery in lots of 1000 tons, and about 800 tons will be required for delivery on barges or boats at Port Eads or Burwood or for other ports as may be designated. Address Major Edward H. Schulz, Corps of Engineers, United States Engineer Office, Room 325, Custom House, New Orleans, La.

**+No. 565—Whitehall, Mich.**—The Whitehall Municipal Electric Light and Water Works Plant at this place will contract about May 15 for their annual requirements of coal involving approximately 1000 tons of three-quarter lump. Address Supt. E. Nelander, Whitehall Municipal Electric Light and Water Works Plant, Whitehall, Mich.

**+No. 566—Boston, Mass.**—The Board of Education will receive bids until noon, Apr. 20, for furnishing the fuel requirements at the public schools for the period from June 15 of the current year to Jan. 31, 1916, with the provision that deliveries shall be continued until June 15, 1916, in the event that an appropriation is made therefor and the School Committee so orders. Prices quoted are to include delivery in the bins as designated. About 60% of the tonnage may be put in during July and August of the current year. The approximate tonnages are as follows: City proper: Anthracite furnace, 1900 tons; egg, 470 tons; bituminous, 4900 tons. South Boston, anthracite furnace, 750 tons; egg, 200 tons; bituminous, 2300 tons. East Boston, anthracite furnace, 380 tons; egg, 250 tons; bituminous, 2100 tons. Roxbury, anthracite furnace, 1400 tons; egg, 250 tons; bituminous, 5200 tons. Dorchester, anthracite furnace, 1200 tons; egg, 500 tons; bituminous, 4600 tons. Charlestown, anthracite furnace, 250 tons; egg, 50 tons; bituminous, 1600 tons. Brighton, anthracite furnace, 700 tons; egg, 100 tons; bituminous, 800 tons. West Roxbury, anthracite furnace, 650 tons; egg, 300 tons; bituminous, 1200 tons. Hyde Park, anthracite furnace, 50 tons; egg, 230 tons; bituminous, 500 tons. The gross requirements are: Anthracite furnace, 7280 tons; egg, 2320 tons; bituminous, 23,200 tons. Prospective bidders must furnish a certified check for \$50 for each district on which a bid is submitted and the successful bidder must furnish a satisfactory bond for 20% of the estimated amount of the contract awarded. Address Business Agt. William T. Keough, Room 801, City Hall Annex, Boston, Mass.

**+No. 567—Brookline, Mass.**—Sealed proposals will be received by the local city government until 3:50 p.m., Apr. 26, for furnishing approximately 2963 tons of anthracite coal and 2000 tons of bituminous. Specifications in detail can be had on application. Address Secy. of Board Edward A. McEtrick, Town Hall, Brookline, Mass.

**+No. 568—Albany, N. Y.**—Bids are requested by the State Government for coal to supply the public buildings, deliveries to be made during the fiscal year beginning May 1, 1915. The approximate tonnages required are as follows: 10,000 tons of No. 1 buckwheat, 2500 tons of bituminous slack coal, 600 tons of anthracite grate, 50 tons of anthracite stove or chestnut. The No. 1 buckwheat and bituminous coal is to be delivered at the coal bunkers of the Capitol Power House, and the other sizes are to be delivered as required at the Executive Mansion, State Hall and Geological Hall. Address Superintendent of Public Buildings, Capitol, Albany, N. Y.

## Contracts Awarded

Note—Successful bidders are noted in **bold face type**.

**+No. 199—Albany, N. Y.**—The awards on this contract (p. 400), which provides for furnishing and delivering coal to the various State Hospitals, were as follows: **Empire Coal Mining Co.**—Broken, (W.) \$2.39; (Bu.) \$2.44; (Mo.) \$2.79. Chestnut, (W.) \$2.55; (Mi.) \$2.53; (Bu.) \$2.59. Stove, (W.) \$2.44; (Mi.) \$2.42; (Bu.) \$2.48; (Mo.) \$2.83; (K. P.) \$2.70. Pea, (K. P.) \$1.96. **J. F. Schmadcke**—Broken, (Mo.) \$2.60; (L. I.) \$2.50. Buckwheat, (L. I.) \$1.20. **J. W. Peale**—Broken, (St. L.) \$2.60. Buckwheat, (H. R.) \$1.455; (Ma.) \$1.14; (Ci.) \$1.16; (Bi) 96c. **A. Larner**—Broken, (Mo.) \$2.74. Pea, (Co.) \$1.94. **Dodson & Co.**—Broken (H. R.) \$2.45; (St. L.) \$2.79. **Nealen Co.**



—Chestnut (H. R.) \$2.59; (Mi.) \$2.44; (Mo.) \$2.77; (Cl.) \$2.81. **James T. Holahan**—Chestnut (St. L.) \$2.87. Screened nut (Ro.) \$1.45. Stove (R.) \$2.72. **Weston & Dodson**—Chestnut (H. R.) \$2.63; (St. L.) \$2.81. **H. E. Meeker**—Stove (H. R.) \$2.52. Buckwheat (H. R.) \$1.38. **Bowns Co.**—Stove, (Ma.) \$2.397. **Neale Co.**—Stove, (H. R.) \$2.48; (Mi.) \$2.32; (Bl.) \$2.35; (Ma) \$2.66; (Cl.) \$2.70; (Mi.) \$1.65; (Mi) \$1.31. **Bacon Coal Co.**—Stove, (L. I.) \$2.95. **Wm. Farrell & Son**—Pea, (Ma.) \$1.60. **H. H. Linneweaver**—Buckwheat, (K. P.) \$1.15; (Cl.) \$1.17. **G. D. Harris**—(Cl.) \$1.5375; (K. P.) \$1.5175. **C. D. Norton**—Mine-Run, (W.) \$1.245. **Dexter & Carpenter**—(St. L.) \$1.48. **C. D. Norton**—(K. P.) \$1.53. **Geo. Hall**—Slack, (St. L.) anthracite \$1.385; bituminous \$1.435. **Geo. D. Harris**—(L. I.) \$1.71. **Morris Run Coal Mining Co.**—(Bl.) \$1.24. **Emmons Coal Co.**—(Bl.) \$1.24.

The abbreviations used designate the following places of delivery: Utica State Hospital, (U.); Willard State Hospital, (W.); Hudson River State Hospital, (H. R.); Middletown State Homeopathic Hospital, (Mi.); Buffalo State Hospital, (Bu.); Binghamton State Hospital, (Bl.); St. Lawrence State Hospital, (St. L.); Rochester State Hospital, (Ro.); Gowanda State Homeopathic Hospital, (Go.); Mohansic State Hospital, (Mo.); Kings Park State Hospital, (K. P.); Long Island State Hospital, (L. I.); Manhattan State Hospital, (Ma.); Central Islip State Hospital, (Cl.). Address Purchasing Committee for New York State Hospitals, Room 138, Capitol, Albany, N. Y.

†No. 306—Algoma, Wis.—This contract (p. 488), which provides for furnishing the local City Water and Light Plant with approximately 900 tons of coal for delivery over the next year, has been awarded to the **Hilton Fuel & Transportation Co.**, at \$3.55 per ton, as compared with \$3.70 last year. Address Supt. J. O. Posson, City Water & Light Plant, Algoma, Wis.

†No. 347—Burlington, Ia.—The award on this contract (pp. 528 and 566), which provides for furnishing the local municipality with coal for the fiscal year ending Mar. 31, 1916, was made to the **Cave Coal Co.** at the following prices: Lump, \$2.70 and \$2.90; mine-run, \$2.30; Fulton County, 1½-in. screenings, \$1.75; Franklin County, 2-in. screenings, \$2.25. Address City Clk. Robt. Kroppach, Burlington, Ia.

†No. 383—New York, N. Y.—Awards on this contract (pp. 567, 664), which provides for furnishing and delivering coal to the Bellevue and allied hospitals, Departments of Correction, Public Charity, Bronx and Queens Parks, were as follows: **Bacon Coal Co.**, (18) egg, 260 tons at \$6.05; (21) 245 tons at \$6.15; (24) stove, 20 tons at \$6.59; (19) 40 tons at \$6.05; (22) 20 tons at \$6.15; (20) 250 tons of pea at \$4.44; (23) 95 tons of egg at \$6.59. **Philip Ditez Coal Co.**, (28) 106 tons of egg at \$5.90. **Pattison & Bowns**, (31) 1400 lb. of egg at \$5.27; (32) 600 lb. of stove at \$5.27. **George D. Harris & Co.**, (34) bituminous mine-run at \$2.77; (35) 200 tons of gas coal at \$3.40. **Meeker & Co.**, (33) 7800 tons of buckwheat at \$2.68. **M. L. Bird**, (9) 330 tons of pea at \$4.73; (10) 700 tons of buckwheat at \$3.73. **John E. Donovan**, (11) 438 tons of egg at \$5.98; (12) 50 tons of anthracite at \$5.98. **William Brennan**, (4) 786 tons of egg at \$5.95; (5) 8 tons of stove at \$5.95. **Burns Bros.**, (7) 1112 tons of egg at \$6.09; (8) 30 tons of stove at \$6.68; (14) 499 tons of egg at \$6.09; (15) 320 tons of stove at \$6.34; (17) 407 tons of egg at \$6.09. **Meyer Denker Sinarum**, (3) 1000 tons of pea at \$4.25. **John F. Schmadeke**, (16) 2650 tons of pea at \$4.57. **John W. Peale**, (6) 1000 lb. of buckwheat at \$3. **Jamieson & Bond Co.**, (27) 18 tons of egg coal at \$6.90. **Burns Bros.**, (26) 190 tons of egg coal at \$6.09. **A. M. Ryan**, (29) 65 tons of egg coal at \$6.90. **J. E. Backus Sons**, (30) 218 tons of egg at \$6.84. **John W. Peale**, (25) 250 tons of pea at \$4.75. **Jurgen-Rathjen Co.**, (30) 218 tons of egg at \$6.77. Address Contract Clerk, Room 1226, Municipal Bldg., New York.

†No. 410—Lebanon, Penn.—This contract (p. 568), which provides for furnishing the local light company with coal during the next year has been awarded to **C. G. De Huff**, the lowest bidder, on the following basis per gross ton: Egg, \$5.42; stove, \$5.72; nut, \$5.87; pea, \$4.37. Address Sec. John H. Seltzer, Lebanon School Board, Lebanon, Penn.

†No. 455—Clinton, Mass.—This contract (p. 627), which provides for furnishing the local school department with coal, has been awarded to **Connery Bros.** on the following basis: 457 tons of Pardee Bros. Lattimer-Lehigh egg coal, \$7.65, and 70 tons of Pardee Bros. Lattimer-Lehigh broken coal at \$7.45. Address Secy. of School Comm., F. E. Clerk, Clinton, Mass.

No. 528—Boston, Mass.—We are informed on good authority that this contract (p. 666), which provides for the requirements of the Boston Elevated Ry. Co., has been closed with the **New England Coal & Coke Co.** It is said that New River coal has been contracted for, and prices involved are not available. The contract provides for 275,000 tons per annum. Address Pur. Agt. Edward Mahler, Bureau of Purchase, Boston Elevated Ry. Co., 101 Milk St., Boston, Mass.

## Contract Notes

**Argentina**—Due to the coal shortage in Argentina, there has been a decided advance in price. The local price at Buenos Aires is now \$15.57. The freight rate from Cardiff, Wales, is \$8.76.

**Europe**—An American consular officer in Europe cables that there is need in that country for 1,000,000 tons of American coal.

**New York, N. Y.**—Effective Apr. 1, the output of the Sterrick Creek Colliery of the Temple Iron Co. will be marketed through the Thorne Neal Co. Heretofore the product from this mine has always been handled by Williams & Peters.

**Buffalo, N. Y.**—The lowest bidders for furnishing the Buffalo Hospital with slack coal for the period from April to October were the Frick Coal & Coke Co. and the C. L. Amos Coal Co. at \$1.90.

**Baltimore, Md.**—The Keystone Coal & Coke Co., Baltimore, Md., has closed contracts for furnishing 40,000 tons of bituminous coal to be delivered at Mediterranean ports, beginning May 1. To fulfill this contract, the company will use two steamships a month, carrying 5000 tons each.

**Louisville, Ky.**—R. E. Wathen, 104 West Main St., will act as the purchasing agent for various distilleries and breweries throughout Kentucky. He will contract for approximately 600,000 tons of slack, nut and lump coal, the contracts to be closed about July 1. Specifications stating grade of coal required, place and conditions of delivery may be secured at any time.

**Foreign**—A communication has been received by the Bureau of Foreign and Domestic Commerce from a business man in Europe who wishes to secure the names and addresses of exporters of coal and coke.

**St. Louis**—On the 1st of April contracts expired in St. Louis for approximately 647 cars per month of steam coal for St. Louis proper. This was divided into 418 cars of 2-in. screenings, 74 cars of No. 4 nut and 155 cars of lump and egg. For the past year, three-fourths of all the steam users in St. Louis have been buying in the open market. For the coming season it is expected that about one-fourth will continue buying in the open market, the remainder signing up on contract.

**New York**—The Lehigh & Wilkes-Barre Co. has been awarded a large contract for broken coal by the Standard Oil Co. Delivery is to be made at Constable Hook and Bay Ridge.

**Fall River, Mass.**—The American Printing Co. recently awarded a contract to the Chesapeake & Ohio Coal Agency for furnishing about 75,000 tons of New River coal.

**The Central New England Ry. Co.**, a subsidiary of the N. Y., N. H. & H. R.R. Co., has awarded a contract for 150,000 tons of locomotive coal to the New England Coal & Coke Co. The West Virginia gas coal of the Federal Coal & Coke Co. will be used.

**The Reading Circular**—Taking effect Apr. 1, the prices of this company's coals, delivered on board vessels at Port Richmond, Philadelphia, for shipments beyond the capes of the Delaware, and New York shipping port, are as follows:

Grade	Philadelphia (Port Richmond)				New York			
	Broken	Egg	Stove	Chest.	Broken	Egg	Stove	Chest.
Free white ash...	\$4.75	\$5.00	\$5.00	\$5.25	\$5.00	\$5.25	\$5.25	\$5.50
Hard white ash...	4.85	5.00	5.00	5.25	5.10	5.25	5.25	5.50
Shamokin.....	.....	5.25	5.25	5.25	.....	5.50	5.50	5.50
Schuylkill red ash.....	.....	5.50	5.50	5.50	.....	5.75	5.75	5.75
Lorberry.....	.....	5.50	5.50	5.50	.....	5.75	5.75	5.75
Lykens valley...	5.75	6.00	6.00	6.00	6.00	6.25	6.25	6.25

Prices f.o.b. mines are:

Sizes	Mahanoy and Shenandoah	Locust Mountain and Schuylkill		Lorberry and Schuylkill Red Ash	Lykens Valley Red Ash
		White Ash	Shamokin		
Lump.....	\$3.50	\$3.50	.....	.....	.....
Steamboat.....	3.50	3.50	.....	.....	.....
Broken.....	3.50	3.50	.....	\$3.75	\$4.10
Egg.....	3.75	3.75	\$3.75	4.00	4.35
Stove.....	4.00	4.00	4.00	4.25	4.60
Chestnut.....	4.15	4.15	4.15	4.25	4.60
Pea.....	2.50	2.50	2.50	2.60	2.75
Buckwheat.....	1.50	1.50	1.50	1.60	2.35

Orders that are accepted will be subject to ability to ship during the month of April, and all unfilled orders will be canceled at the end of the month. The railway company's manifest weight to govern in all cases.

The company reserves the right to change prices at any time without notice, and orders sent in will not bind the company until accepted.

A reduction of 50c. per ton from the above prices will be made on broken, egg, stove and chestnut, shipped during the month of April, 1915.